THE

MAGAZINE

OF

USEFUL AND ENTERTAINING KNOWLEDGE.

"GET WISDOM: AND WITH ALL THY GETTING, GET UNDERSTANDING."

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INTRODUCTION.

THE present number commences the second volume of this work. It was undertaken not without *some* apprehensions that it might be doomed to share the fate of the many periodicals which had been commenced in this city, under auspices perhaps more favourable to their permanency, but which, after lingering out a sickly existence of a few months, were suffered to expire for want of adequate support.

In taking a view, however, of the advanced and advancing state of science and the arts, in this, as well as in other countries, and the strong and generous desire, that pervades every enlightened nation at the present day, to extend the boundaries of their information in every department of useful knowledge, we thought we saw the want of a periodical work in this city, which should be devoted exclusively to the dissemination of useful information, and the aid of the great work of mental and moral improvement; nor had we *much* doubt that such a work would meet with a generous support from the liberal and enlightened citizens of this country. In this opinion we were also confirmed, by that of men whose judgments are entitled to all the deference due to great scientific attainments, close observation, and much experience. Although we cannot yet boast of a very extensive list of patrons, still we have great reason to be encouraged; our subscribers

are as numerous as we could reasonably expect in so short a time, and their number is daily and rapidly increasing; we by no means, therefore, despair; on the liberality and intelligence of the Public, and their disposition to encourage the dissemination of general intelligence and useful information, we found our hopes of success; and if we have not formed too high an estimate of these qualities in the American People, we may look to them with confidence for that support to which the merits of our work, whatever they may be, shall entitle us. This is all we can expect; it is all we ask; but we *do* ask this, and we have a right to expect it.

An Editor of a periodical, especially of the miscellaneous kind, has been aptly likened to the master of a feast, who endeavours to set before his visiters not only those substantial dishes that afford nourishment and support to the body, but many of the little delicacies that merely gratify the palate. With equal propriety may the readers of such a work be compared to guests. After all the care and pains of their kind and attentive host, to set before them all that can provoke the appetite or gratify the taste, still there may be some things on the table that this or that person may not relish; nevertheless, if they are well bred, they will forbear making any ill-natured remark, but select such things as they prefer, and politely commend them to others. Assuming that this comparison is applicable to ourselves and our readers, we take this occasion to assure them that we shall do all in our power to entertain and please them, and we flatter ourselves that we shall merit some portion of their commendation. It is impossible, however, where there is such a diversity of tastes, that all should be equally well pleased at all times; yet, with the variety that will always be found in the Magazine, he that is disposed to be gratified will seldom be unable to find something agreeable; nor, on the contrary, will he that is disposed to find fault, be at a loss to select something on which to vent his spleen.

We shall be ever ready to receive such suggestions or advice in regard to our work, as our readers may think proper to give, and shall always be grateful for any hint calculated to improve it; but after all, our great aim will be to please *ourselves*, believing that if we can do this, we shall, most likely, give *general* satisfaction to our readers.

BIOGRAPHY.

BIOGRAPHICAL SKETCH OF COLUMBUS.

[Continued from page 340, Vol. I.]

Columbus was by no means disposed to rest satisfied with what he had already done, and he accordingly lost no time in preparing for a second voyage. Ferdinand, in compliance with what was then considered the prerogative of the Pope, made application for a papal bull, vesting in the Spanish sovereigns, the dominion over such lands as had been, or should be discovered in the western seas, which was granted on the 2d of May, 1493, on condition of the Catholic faith being propagated in all such countries. In the meantime the preparations for the second voyage progressed with such rapidity, that a fleet of seventeen sail was soon ready, and on the 25th of September, Columbus put to sea. Although the number of persons who was permitted to embark, was limited to one thousand, yet was the anxiety to visit "the golden regions, and delightful climes, where nothing but wealth, and wonder, and enjoyment, awaited them," so great, that there were eventually about fifteen hundred sailed in the fleet.

In going out, Columbus touched at the Canary Islands, for the purpose of taking in live stock, seeds, plants, &c., to be propagated in the countries which he had discovered. The weather being propitious, land was descried on the 2d of November: it proved to be an island, to which he gave the name of Dominica. In the island of Guadaloupe, Columbus first met with that delicious fruit, the pine-apple. To their great surprise, the Spaniards also found, on the shore of this island, the sternpost of an European vessel.

From Guadaloupe, Columbus cruised along the Carribean sea, and touched at several islands, one of which he named Santa Cruz. Sailing from hence he discovered the large island, now known by the name of Porto Rico. At length he arrived in the harbour opposite La Navidad, where he had built a fort and left a part of his former crew; but to his great sorrow he found the fortress demolished, and deserted by every human being. In searching about the ruins and in their vicinity, he found the bodies of eleven Eu-

ropeans, which, with other circumstances, convinced him that violence, if not treachery, had been used. He was not, however, kept long in suspense ; a few of the natives having at length made their appearance, he soon learned from them the disastrous fate of those he had left in charge of the fortress.

Instead of following the advice and injunctions of Columbus, to cultivate the friendship and good will of the natives, they had treated them with great indignity and harshness, robbing them of their gold trinkets, and seducing their wives and daughters. Quarrels arose among themselves,and order and subordination were soon discarded; in this state of things they were attacked by a powerful and wily neighbouring cacique, Caonabo, who stole upon them in the dead of night, put them to death, and set fire to the fortress.

"Such," says Mr. Irving, "is the story of the first European establishment in the new world. It presents in a diminutive compass an epitome of the gross vices which degrade civilization, and the grand political errors which sometimes subvert the mightiest empires. All law and order were relaxed by licentiousness; public good was sacrificed to private interest and passion ; the community was convulsed by divers factions, until the whole body politic was shaken asunder by two aspiring demagogues, ambitious of the command of a petty fortress in a wilderness, and the supreme control of eight and thirty men."

Such being the fate of the first colony which Columbus had attempted to plant in the new world, and the site of the fort being low and unhealthy, he now set about searching for a more favourable place for a town : a spot being selected, the future city received the name of Isabella, in honour of his royal patroness ; here every thing was disembarked, and several houses and a church were commenced.

The houses of the new city having been got in such a state of forwardness as to afford shelter and protection to those who were to occupy them, and Columbus having procured a small quantity of gold from the interior of the island, he now despatched twelve of the ships to Spain, retaining five only for the use of the colony. Many of the new colony had left Spain with the expectation of finding in the new world a paradise, abounding in gold and silver, and the most delicious fruits ; where they could rove about amid spicy groves, and collect any quantity of the precious metals with no other

trouble than that of picking them up. It is not strange that such persons, finding themselves surrounded by a wilderness, deprived of the luxuries and conveniences of life to which they had been accustomed, and subject to new and dangerous maladies, should fall into despondency and become discontented; nor is there ever wanting on such occasions, persons who are ready to exaggerate evils that are suffered, and paint in lively colours the enjoyments of which they are deprived. Those who formed the new colony had all been obliged to undergo the toils, the privations, and the hardships incident to the settling of a new country, and being generally unaccustomed to labour, and disappointed in their hopes of wealth, they at first desponded, then murmured, and then conspired; but their purpose, which was to seize upon the remaining ships and return to Spain, was frustrated by the vigilance and firmness of Columbus.

Having restored tranquillity and settled the affairs of the little colony, he placed the government in the hands of a junta, and departed on a voyage of further discovery. Columbus had in his former voyage along the coast of Cuba, supposed that island to be a part of the continent of Asia; his present object was to ascertain that fact. If such were the case, he calculated that by following along the coast he should soon arrive at a part of the country inhabited by semi-barbarians, but highly commercial and abounding in gold and precious stones. How little did he know of the dimensions of the earth, and how surprised would he have been to have learned the fact, that he was then more than twelve thousand miles from the part of the country he was seeking!

Having sailed along the southern coast of Cuba for several days, and being invariably informed by the natives of whom he inquired for gold, that it was to be found in great abundance at the south, Columbus concluded to search in that direction for those golden regions which had as yet baffled his pursuit. He had not sailed many hours in this direction before he discovered the large and beautiful island of Jamaica. Here he found the natives much farther advanced in arts, and more warlike than those of Cuba and Hayti; their canoes, particularly those of the Caciques, were very large, and highly ornamented at the bows and stern with carvings and painting. As he found the island did not abound in valuable minerals, Columbus again turned his prow towards Cuba, along which he coasted to the westward for several days.

At length the ships having become leaky and crazed, the provisions nearly exhausted, and the crews worn out with fatigue, and clamorous to return, Columbus being fully convinced that he had been coasting along a continent instead of an island, abandoned the further prosecution of the voyage, and put about on his return. "At this very time," says Mr. Irving, "a ship boy at the mast head might have overlooked the group of islands to the south, and have beheld the open sea beyond. Two or three days farther sailing would have carried Columbus round the extremity of Cuba, would have dispelled his illusion, and probably have given an entirely different course to his subsequent discoveries." On his return, Columbus encountered a violent storm: after this had subsided, exhausted by the excessive fatigues and privations he had undergone, and the almost super-human exertions he had made during the voyage, he sunk into a state of lethargy which his companions were apprehensive would end in death. In this state of insensibility he arrived at Isabella, after an absence of about five months.

To his unspeakable joy and surprise, Columbus, on recovering his senses, found his brother Bartholomew, from whom he had been separated for many years, at his bed side. This brother appears to have been a favourite with Christopher, and is represented as being "prompt, active, decided, and of a fearless spirit; tall, muscular, vigorous, and commanding." Of the assistance of such a person, and above all of such a brother, Columbus stood much in need, not only on account of his own ill health, but on account of the discordant and rebellious state of the colony, and he accordingly immediately invested him with the office of Adelantado, or lieutenant governor.

During the absence of Columbus, two important persons, namely, Margarite, who had the command of a large portion of the military force of the colony, and Friar Boyle, not only refused to obey the orders of the junta, but after rousing the indignation and hatred of the natives by their licentious and oppressive conduct, seized upon some vessels in the harbour, and with their adherents returned to Spain to fill the ears of the Spanish monarchs with complaints and misrepresentations.

The affairs of the colony were at this time in a very critical situation. Afterthe departure of Margarite, the soldiers roved about singly and in squads, treating the natives with every kind of indigni-

ty and oppression; the licentiousness of these lawless and insolent bands, and the apparent weakened and distracted state of the colony, at length produced a league among some of the Caciques of the island for the destruction of those whom they had welcomed as divine beings, but who had proved to possess more of the demoniac, than of the divine spirit. Such being the state of matters, it required all the address, decision, activity, and energy of Columbus, and his brother Bartholomew, to avert, or successfully contend with the coming storm. Fortunately the opportune arrival of four ships from Spain, bringing out husbandmen and various artisans, together with an ample supply of provisions, raised the flagging spirits of the colonists, and infused vigour into their minds as well as bodies.

Several skirmishes had already taken place between parties of the Spaniards and bodies of the natives, in which the latter had in every instance been routed with great loss. At length the confederated Caciques assembled their warriors, to the number, as has been said, though probably with great exaggeration, of 100,000, in the plains called the Vega, near the scite of the present town of Santiago. Against this numerous body of Indians, Columbus led his little force, which amounted to two hundred infantry, and twenty horse. In addition to this force, however, he had about twenty blood-hounds, which were fierce, terrible, and destructive to the naked Indians. Unaccustomed to the din of drums, the clangour of trumpets, and the destructive discharge of fire-arms, the Indians were seized with a panic at the first onset, and fled with dismay in every direction: in their flight thousands were trampled to death by the cavalry, or overtaken and torn to pieces by those animals to whose cruel and rapacious nature the Spaniards seemed to be closely allied.

Columbus having thus reduced the whole island to subjection, now imposed a general tribute. Each individual above the age of fourteen years, inhabiting that part of the country in which gold was to be found, was required to furnish the measure of a hawk's bill of gold dust, equal to the value of about fifteen dollars, every three months. The Caciques were assessed a much larger amount. In those parts of the island where no gold was to be found, twenty-five pounds of cotton were assessed and received in lieu of it.

Thus were this simple and harmless people, who had welcomed the arrival of the Spaniards as the visit of a superior order of beings that had descended from the skies, and whose appearance they looked upon as the most fortunate and propitious event, in a few months reduced to subjection and servitude, and liable to be hunted with blood-hounds, and punished if they did not comply with the requisitions imposed upon them. "The pleasant life of the island was at an end; the dream in the shade by day; the slumber, during the sultry noontide heat, by the fountain or the stream, or under the spreading palm-tree; and the song, the dance, and the game in the mellow evening, when summoned to their simple amusements by the rude Indian drum. Or if they occasionally indulged in a national dance, after a day of painful toil, the ballads to which they kept time were of a melancholy and plaintive character, bewailing the loss of their liberty and their painful servitude." In addition to the tribute imposed, Columbus, it is painful to add, bedimmed the bright escutcheon of his glory, by sending five hundred prisoners to Spain, to be sold as slaves; but to the honour of Isabella, she sent them back to their own country, refusing to allow them to be sold.

On the arrival in Spain of the rebellious Margarite and his coadjutor Friar Boyle, they filled the ears of Ferdinand and Isabella with calumnious reports respecting the conduct of Columbus and his brothers, and accused him of grossly deceiving them in regard to the importance and value of the countries he had discovered. The accusations were confirmed by all those who, not finding the country to be that golden paradise which their imaginations had pictured it, had returned in disgust, and were ready to vent their spleen upon him who, though he had found a new world, had not been able to transmute its mountains into gold, or its rocks into diamonds, and the monarchs determined on sending out some person to inquire into the alleged abuses. The person selected for this service was Juan Aguado who on returning from the West Indies, had been recommended to royal favour by Columbus.

Aguado had been kindly treated by Columbus, but the "little brief authority" with which he was now invested, completely turned his head, and erased all remembrance of obligations. On arriving at Hispaniola, the admiral being absent, he immediately assumed upon himself the government of the island, and conducted towards his former benefactor with that insolence which is characteristic of a

mean spirit and a little mind. Columbus on this occasion behaved with great moderation and dignity, deeming Aguado too contemptible a person for him to quarrel with. Aguado, encouraged by what he supposed to be a want of courage or spirit in Columbus, proceeded to collect evidence to sustain the charges that had been made against him. "Every dastard spirit, who had any lurking ill-will, any real or imaginary cause of complaint, now hastened to give it utterance. It was a time of jubilee for offenders; every culprit started up into an accuser; every one who by negligence or crime had incurred the wholesome penalties of the laws, was loud in his clamours of oppression; and all the ills of the colony, however produced, were ascribed to the mal-administration of the admiral."*

With this mass of slander, and outpourings of the discontented and malevolent, the commissioner determined to return to Spain; Columbus also thought it time to appear before his sovereigns to vindicate his conduct. The vessels were got ready for sea, but a tremendous storm coming on, their embarkation was delayed for some weeks. In the meantime some valuable mines were discovered, where gold could be obtained in greater quantities, and in larger particles, than at any other mine that had yet been found. This was a most opportune and fortunate event to the admiral, as it enabled him to furnish himself with that which would have the most weight upon the mind of Ferdinand, and would most effectually silence the cavils of his enemies.

On leaving the island, he invested his brother with its command during his absence, with the title of Adelantado. Many of those who had come out to the new world in the expectation of amassing immense fortunes, now returned with him, "bearing in their yellow countenances a mockery of that gold which had been the object of their search, and who had nothing to relate of the New World, but tales of sickness, poverty, and disappointment."

The reception which the admiral met with from the sovereigns was of a different kind from what he had anticipated, being treated by them with marked respect. He gave them a lively account of his recent voyage along the coast of Cuba, which he supposed to be the continent of which he was in search, and also of the valuable mines that had lately been discovered, and which he represented to be the Ophir of the ancients. He now asked for eight ships, two

* Irving.

of which were to be freighted with supplies for the colony, and with the remaining six he proposed to undertake another voyage to extend his discoveries, and to annex still more important countries to the Spanish kingdom than any he had yet discovered. These were promised, but the minds of Ferdinand and Isabella were so much engrossed by other matters, which they considered of more importance, that Columbus was again doomed to undergo the penance of inactivity, delay, and suspense. He had landed at Cadiz, on his return, on the 11th of June, 1496; but it was not until the 30th of May, 1498, nearly two years after, that he was enabled to depart on his third voyage of discovery. Two of the vessels he despatched immediately to Hispaniola with supplies for the colony; with the other three he took a more southern route than he had ever before followed, but which he was soon obliged to abandon on account of the extreme heat and dead calms he met with.

On the 31st of July, he discovered three mountains, which on approaching them, proved to have but one base; from this circumstance he gave the island on which they were situated the name of La Trinidad, the name it still bears. Sailing along the southern coast of this island he now for the first time, though not aware of it, perceived a part of that immense continent of which he had been so long and so anxiously in search. While coasting about in the gulf of Paria, Columbus approached the promontory of that name, and landed on it, taking it however for an island. Here he had various interviews with the natives, whom he found to be fairer than those inhabiting the islands further north, with long straight hair, well proportioned bodies, active, and lively; from these he obtained great quantities of pearls, some of which were of an uncommonly large size.

So valuable were the pearls which Columbus was collecting from the natives, that it was with reluctance he left the gulf of Paria to return to Hispaniola; but the exhaustion of nearly all his sea stores, a protracted attack of the gout, and the disease of his eyes, which nearly deprived him of sight, brought on by excessive fatigue and over watching, obliged him to do so. He set sail on the 14th of August, and in a few days, had the joyful satisfaction of entering the desired haven, and of again receiving the affectionate greetings and soothing attentions of his favourite brother, now doubly acceptable, on account of his infirm health, and emaciated condition.

Instead of that tranquil repose which Columbus had hoped to enjoy on his arrival, and of which he stood in so much need, new and severe trials awaited him. During his absence, one Francisco Roldan, a man of a mean birth, who had been raised from obscurity, and promoted by Columbus from one office to another until he had reached that of Alcade-Mayor, or chief Judge, had contrived to sow discord among the inhabitants of the colony, and finally succeeded in organizing a faction to join him in open rebellion against the authority of the Adelantado. With about seventy followers of the most desperate character, whom he armed by breaking open the public stores, he retired to a remote part of the island, and by his artful professions of friendship and assistance, he instigated several Caciques of the island to unite for the destruction of the Adelantado, and those who adhered to him. Roldan had attempted to gain possession of Fort Conception, which was situated in the interior of the island, by surprise, but did not succeed; Don Bartholomew, however, was at this time reduced to the last extremity, being shut up and besieged in the fort, his munitions of all kinds rapidly failing, and himself doubtful of the fidelity of his own garrison. At this critical juncture, the two ships which Columbus had despatched to the relief of the colonists, arrived, bringing with them a supply of provisions, arms, and munitions of war. No relief could be more opportune; he was now enabled to take the field against his enemies, and soon reduced the Indians to submission; but his magnanimity prevented him from attacking Roldan and his band of rebels, who had retired to the beautiful province of Xaragua.

Such was the state of things on the arrival of Columbus, who immediately issued a proclamation approving the conduct of his brother, and denouncing Roldan and his followers as rebels; these, however, being more numerous than any force which he could depend on to act against them, a resort to arms he found would only betray his weakness, and he therefore adopted the only alternative left him, of temporizing and negotiating.

In the meantime Columbus despatched some vessels to Spain, and wrote to the Sovereigns, giving an account of his discoveries, and sending a chart of the coast, and specimens of the pearls he had collected. He also informed them of the rebellion of Roldan, and among other salutary suggestions, recommended that a person learned in the law, should be sent out to officiate as Judge over the island.

Roldan and his friends also sent letters to Spain by this conveyance, filled with false and calumnious accounts of the oppression and injustice of Columbus and his brothers, and painting their conduct in the blackest colours.

Anxious to prosecute his discoveries, Columbus resolved to comply with almost any demand that Roldan should make, rather than not restore tranquillity to the island, especially as he began to apprehend that others of the colonists would follow the pernicious example, and establish an independent government of their own, or rather choose to live in unrestrained idleness and licentiousness in another part of the island. He therefore departed from San Domingo for the purpose of having an interview with Roldan; the latter, however, conducted more like a conqueror dictating terms, than like one who deserved to suffer the severest penalties of that law which he had so grossly violated. "The mind," says Mr. Irving, "grows wearied and impatient with recording, and the heart of the generous reader must burn with indignation at perusing, this protracted and ineffectual struggle, of a man of the exalted merits and matchless services of Columbus, in the toils of such contemptible miscreants." At length terms were agreed upon, and Roldan, on being reinstated in his office of chief judge, returned to his duty, yet with so much insolence and arrogance, that it was a most trying task for Columbus to bear with him.

Scarcely were matters arranged with Roldan, when the peace and quiet of the island was again disturbed by another person. This was Alonzo de Ojeda, formerly one of the most active and daring followers of Columbus. Being in Spain when Columbus's account of his discovery of the continent arrived, he obtained copies of all the charts which had accompanied that account, and having fitted out several vessels, he sailed for the gulf and coast of Paria; in this squadron sailed Amerigo Vespucci, a Florentine merchant, from whom the continent afterward took its name. The adventurers having ranged along the coast of the continent for more than a hundred leagues, and discovered the gulf of Venezuela, were now returning; but their supplies being exhausted, they landed on the island of Hispaniola, for the purpose of replenishing them. Not content with doing this, Ojeda undertook to redress the grievances which many of the late rebels did not fail to represent to him they were suffering. Roldan was despatched against him,

by the admiral, as being the most fit person to cope with one who, like himself, was reckless of danger, crafty, and faithless: a contest ensued, but Ojeda was finally driven from the island, and nearly all the late band of rebels destroyed by their former leader.

Having thus subdued the rebels, some of whom were brought to trial, and underwent the punishment of death, the Admiral now hoped to preserve the tranquillity of the island; and he looked forward to the prosecution of his grand enterprise of exploring, more minutely, the country bordering on the gulf of Paria, and of establishing an extensive pearl fishery. But these were illusive hopes. "At this very moment," observes Mr. Irving, "those events were maturing that were to overwhelm him with distress, strip him of his honour, and render him, comparatively, a wreck for the remainder of his days."

[To be concluded in our next.]

CHEMISTRY.

INTRODUCTORY LECTURE.

The following *Lecture*, delivered by Professor Griscom before a large and highly respectable audience at CLINTON HALL, introductory to a course of Chemical Lectures now being delivered to the Mercantile Library Association, is published at the request of several of the auditors. We have great pleasure in presenting it to our readers, and have no doubt it will be read with much interest.

IT was said more than fifteen years ago, by him whose name is indelibly associated with the noble edifice in which, on the first scientific occasion, we are this evening assembled, that, "taking it for granted that the United States afford every reasonable facility and inducement for the cultivation of letters, it cannot be doubted that this city is the proper site for a great literary and scientific institution. When we view the magnitude of its population, the extent of its commerce, the number of its manufactures, and the greatness of its opulence; when we contemplate its position near the Atlantic, its numerous channels of communication by land or by water with every part of the United States, and the constant intercourse it can maintain with all parts of the civilized world; when we consider the vast fund of talents, information, enterprise, and industry which it contains; and

when we take a prospective view of the rank which it is destined to occupy as the greatest emporium in the world, we must acknowledge that no position could be selected, better adapted for acquiring information, concentrating knowledge, improving literature, and extending science; and we may say of this place, as Sprat, in his history of the Royal Society, said of London: 'It has a large intercourse with all the earth; it is, as the poets describe their house of fame, a city where all the noises and business in the world do meet, and therefore, this honour is justly due to it, to be the constant place of residence for that knowledge which is to be made up of the reports and intelligence of all countries.' "*

The judgment of that truly enlightened citizen, who was taken from us while in the zenith of his career of splendid usefulness, as thus pronounced, will doubtless receive the sanction of every individual now assembled. It is an opinion which has been much canvassed, and which has gained much weight within the last two years, in the most intelligent circles of this city. If, fifteen years ago, the superior fitness of New-York, for the residence, accommodation, and encouragement of all the learning and science which can benefit man in social life, could thus be pronounced, the argument is at the present day redoubled upon us. It was not until several years after this opinion was declared in his inaugural speech, by the president of the Literary and Philosophical Society, that a Legislative sanction was given to the commencement of those artificial water-courses, which have added such an imperishable honour to his name, and which are destined to accelerate the march of this city towards that aggrandisement, which may justify a comparison with the great metropolis of the British Empire.

In this progress we all rejoice. In beholding, from year to year, the addition of street to street, and market to market; in witnessing, after the lapse of a few months, or even weeks, in our walks through the suburbs, the fresh accumulation of handsome edifices; and, in the older parts of the city, constant renovations and improvements, we rejoice in such indubitable evidences of vigour and prosperity. But I hesitate not to believe, that in the breasts of all my auditors, the concurrent sentiment will be, that it is not in the material of streets and houses, of ships and edifices,—the mere increase of physical expansion,—that we are to lay our highest account of congratulation and rejoicing. In this respect, the history of nations is fruitful in lessons of profound wisdom. It teaches us that the solid glory and the true happiness of a people are not in the ratio of their Co-

* Inaugural Discourse of the president De Witt Clinton, before the Lit. and Phil. Society of New-York.

rinthian columns, or the multitudinous assemblages of their crowded cities. Do we envy the glory of ancient Babylon, with its walled circumference of sixty miles, its hundred brazen gates, its hanging gardens, and its lofty towers? Does Athens, or Corinth, or Rome, with all that they could boast of magnificence and numbers, excite our emulation? We might for a while luxuriate in the surpassing splendour of their domes and columns, and the unrivalled beauty of their chiseled ornaments. But would we accept of all this outward glory, and take with it its appendage of tyranny, and slavery, of ignorance and superstition? Even some of the famed cities of modern Europe, with all that they combine of antique greatness and recent embellishment, might not secure our preference, we must take also their various casts of society, their dubious liberty, and the half civilized condition of their inferior classes.

As much, therefore, as we rejoice in the prospects of our metropolitan greatness and wealth, we have a more legitimate source of rational delight in the increase and prosperity of our literary and moral institutions. That the population of New-York is doubled in twenty-five years, is a fact of notoriety. That the facilities and means of instruction, in the common and most useful branches of knowledge, have increased in a greater ratio, is also a consoling fact. Nor has the public mind in our city of latter years been unfurnished with the means of acquiring a knowledge of those portions of the higher sciences which are applicable to the intelligence and wants of youth. I shall not, perhaps, incur the imputation of egotism, if I advert to one or two facts in confirmation of the progress of public instruction.

It is now just twenty-three years, since I first invited the attention of a public audience to an Introductory Lecture on Chymistry. That Lecture was given in a wooden building situated in Broadway, on what is now the north Park, at that time the kitchen garden of the old almshouse. The City Hall had then scarcely arisen above its foundation, and was not finished until five years afterwards. The wooden building alluded to was temporarily devoted to the accommodation of the first Lancasterian, or public school, established in this city. This new mode of instruction being found successful, the brick arsenal at the corner of Chatham-street and Tryon-row, was obtained of the corporation, and at an expense, at that time deemed very considerable, was converted into a Free School No. 1. It was not long before a second, or No. 2, was erected in Henry-street; and such has been the laudable spirit of our municipal and state authorities, seconded by the enlightened zeal of our citizens, and the energy of the public school society, with a Clinton for its president, that a public school No. 12 is now upon the eve of completion. These

are substantial and convenient brick buildings, affording an average accommodation for six or seven hundred pupils. Besides these, there have been established, by different religious societies, numerous charity schools, one of which at least, the Protestant Episcopal Charity School in Varick-street, is an ornamental brick edifice of three stories high. Nor has there been a remissness with regard to schools of a higher grade. Besides the Mechanics' school, in Chambers-street, a truly valuable institution, the New-York High Schools, which contain six or seven hundred pupils, and the Columbia College Grammar School are public edifices for classical and scientific instruction; the numerous private schools also with which the city abounds, have, it is believed, within a few years witnessed an amelioration corresponding with the general impulse in favour of a sound education.

Such, within twenty years, has been the signal advancement of our common and superior schools. But the benevolence of the age, regarding the human mind in its earliest manifestations, as a germ of immortality, has looked upon its infant faculties with a respect and devotion unknown at any former period of the world. In a spirit no less of philosophy than of philanthropy, it has decided, that as soon as the tongue can utter words, and the eye regard objects, the cares of society and the boon of public instruction should be extended. Infant schools have been established, and are now in a successful train of increase and prosperity. It is about seven years since a public meeting, (the first in this city, if not in this country,) was held at Washington Hall, to consider the expediency of introducing such schools, in addition to those already in operation. The chairman of that meeting was De Witt Clinton, under whom I had the pleasure of acting as Secretary. The subject at that time was new to himself as it was to most others; and although from its novelty, it met with some opposition, from a few individuals, his perspicuous and enlightened mind gave a prompt sanction to the measure; and it cannot be questioned, that infant schools will ever hereafter be regarded as among the most beneficent improvements in moral and intellectual cultivation. In addition to these sources of primary instruction, there is last to be mentioned, though not least in importance, our African and Sunday schools. The latter of these, extending their benign agency to the most destitute portion of our youth, are, in this and in other respects, supplying a deficiency of immense importance; and to those who, with a devotion beyond all human praise, are engaged in this labour of love, the city will owe a debt of pure and lasting gratitude.

Beholding, then, the moral aspects of New-York; viewing the provision it has made for education in its early and middle stages, may we not look upon her prospects with emotions far more ennobling than those which spring from the consideration of her gigantic

commerce, her swelling population, or her monuments of marble. May she not, like the celebrated mother of the Gracchi, point to her children, and exclaim, These are my jewels.

But, in a city like this, and in every city, there is a sphere of instruction which ought assuredly to be filled.—There is a class of our population, a numerous class, at a period of life which renders them fit recipients of instruction, whose situations exclude them from the chance of daily education, and which neither our schools nor colleges can reach.

There is the period of apprenticeship,—and the period of juvenile employment,—and the period when young men, although in the incipient stages of business, have minds still so unencumbered with its intrusive cares, as to demand, during their hours of leisure, some additional aliment for their thoughts, and some accessions to their stock of knowledge. It is this period, and these hours, which imprint upon the man his most durable and decisive characters. It is then that are formed those associations, both mental and personal, that give a cast to his affections, and lead him either into the ranks of honour and usefulness, or into the purlieus of worthlessness and dissipation. Is not then a provision for these sensitive periods of life highly becoming a liberal and enlightened condition of society? The erection of this building is demonstrative evidence that this *is* the condition of our mercantile community. The merchants of our city have put forth their hands, and here planted an institution, worthy of the brightest days of a Cosmo or a Doria. May I be pardoned for observing that could I, while standing timidly before my first audience in the small wooden building, before alluded to, or lecturing to the class of one hundred then formed in the second story of a private house in Pearl-street, have anticipated, that in the lapse of twenty-three years I should have the pleasure of meeting a class of one thousand in a saloon founded upon pillars of Granite, appertaining to an institution devoted to that class of citizens, who were, and ever have been among the foremost to patronize my feeble efforts, such an anticipation would have inspired me with a confidence beyond any thing that I have ever experienced: and whether, with the chain of circumstances which have led to this interesting result, those early efforts may, or may not, have had any connexion, I cannot but embrace the present befitting occasion, gratefully to acknowledge the generous support of the few mercantile friends who at that time came forward, with spontaneous liberality, in defence of the principles upon which I had ventured to found my exertions.

Having in the last introductory lecture before this association, expressed at large my conviction of the perfect compatibility of mercantile pursuits, with the acquisitions of science and learning; and

having also dwelt upon the importance, in a city and under a constitution like ours, of finding in the ranks of mercantile life, men who are qualified, in all points, to fill the highest stations in legislation, and government, I shall proceed to the more immediate subject of our present course.

Science is distinct from art. The arts have mostly taken their rise from wants either natural or acquired. But the arts cannot be long pursued among an intelligent people without giving rise to some principles of science. Men of ingenious minds soon discover, in the processes to which they are accustomed, truths which bear a close analogy to other truths,—properties in one class of substances, which have an intimate relation to those of another class. These connecting facts and principles, when generalized as far as is practicable or expedient, constitute science. The sciences therefore have their foundation in human experience. "If we inquire into the most probable order of important discoveries in the natural sciences, we perceive that men must soon have learned that the atmosphere is a conductor of heat, and hence the necessity of a covering of defence, of clothing and of shelter and this would give rise to the earliest notions of Architecture and Mechanics. They must soon have learned that the air by combination, abandons its caloric, and that certain materials will effect this combination. They learn thus to kindle a fire, and to apply it to the culinary and some of the easiest of the chemical arts. In observing that fire softens certain substances, which are susceptible, when hot, of being extended and fashioned by blows and pressure, they apply the metals to the manufactory of arms and implements for the chase. In discovering that water supports light bodies, they conceive the art of navigation for the purposes of fishing. Certain animals may be tamed and multiplied, and from this discovery spring the arts of pastoral life, and the love of travel. Certain plants may be multiplied and improved,—hence the inventions of agriculture. Different climates produce substances of reciprocal utility, and this plants the germ of commercial intercourse. The progress of the seasons is found to be correspondent with the motion of the stars; man therefore studies astronomy, and invents the calendar. Certain relations exist between the position of the heavenly bodies at sea and on land, and he applies astronomy to navigation, and thus extends his geographical knowledge. By studying the properties of the magnet, he becomes more or less independent of the stars, and this in due time leads to the discovery of a new world. By the fabrication of gunpowder, skill obtains an empire over mere brutal force. The art of printing is created, which gives unparalleled extension, and ensures duration to all his other discoveries; and finally

the steam-engine is invented, which supplies him with almost unlimited power."*

The progress in these beneficent arts of civilization would appear indeed to have been very slow, even among the most favoured portions of the human family. To a large part of our race, they are still unknown; and we are sure that it has been by the special bounty of an overruling Providence, that means have been granted us for these enjoyments. Cast, naked and helpless, upon the surface of the earth, man would have remained the most feeble of animals, but for the powerful instinct of association, combined with the faculty of language, and mental abstraction. By the use of language and articulation, mind is enabled to mingle with mind in unbounded freedom, a power denied to all other animals; nor is there any evidence that among the inferior tribes, there exists the faculty of abstract reflection to any extent beyond their immediate or instinctive impulses. Yet without the aid of laborious cultivation, how inefficacious, even in man, are those superior gifts? Without the momentum of education, how soon would the most polished people sink into the apathy and barbarism of the Indian or the Hottentot!

Some of the chemical arts must, as we have stated, have been coeval with the earliest stages of society. It appears highly probable from the testimony of the sacred writings, that these and other arts were taught by superhuman communications to some of the ancestors of our race. The means of extracting iron and copper from their ores were, according to the Mosaic history, taught by Tubal Cain who was the seventh in descent from Adam. The Jews and Egyptians, in the time of Moses, understood the process of wine making, the preparation of oils, spices, and resins, the art of embalming, engraving on gems, dying in various colours, gilding, plating, and in all probability of brewing, and some of the nicer processes of cooking. That sand and soda would combine into glass, was known to the Phenicians. The making of artificial gems was practised by the Egyptians in the time of Pliny, who adverts to the method of detecting their qualities by trying their hardness. Salt, alum, verdigrease, and sal ammoniac were prepared by the same people, who appear to have been unquestionably the most enlightened and enterprising nation of the East, until the overthrow of Alexandria by the Arabians.

* Reported Sketch of a Discourse, by Baron Cuvier. Rev. Ency. 1830.

These merciless destroyers of the libraries of Egypt became themselves the revivers of learning. They were particularly attentive to the secret arts of Chemistry, and from their language are derived many of the terms exclusively appertaining, at the present time, to this science.

The Greeks practised metallurgy to a very considerable extent. The art of making steel, and of combining zinc and copper into brass; of the extraction of gold by amalgamation, as also the art of soap-making, were well understood by that people.

The Romans were scholars of the Greeks and Egyptians; but being generally absorbed in the arts of war and government, there is no evidence of their having made any important accessions either to the abstract or physical sciences. They were acquainted with the arts connected with display in colouring, and in those compositions which give solidity and elegance to their architecture, but they knew nothing of chemistry as a science.

It seems not unreasonable to conjecture, that the chemical arts were cultivated in Hindoostan and China prior to their adoption by the nations on the Mediterranean, and that the progress of those arts has been gradually westward. The light of history is faint on these subjects, but there can be no reasonable doubt of the great antiquity of chemical knowledge among the Chinese, so far as it relates to the manufacture of nitre, borax, alum, calomel, ethiops, sulphur, fire-works of powder, and the manufacture of porcelain. Painting in enamel, and the consequent use of metallic compositions of great brilliancy, have been practised among them from time immemorial. The same may be said of calico printing in Hindoostan, an art which, though greatly inferior, to its present improved state in Europe, is supposed to include some particulars not yet understood by us.

It is not a little singular that during the dark ages, from the middle of the seventh to the middle of the seventeenth century, the few ingenious men whose names and works pierce the thick veil of ignorance which covers that period, should have turned their attention to the hidden qualities of matter, and made contributions to chemistry, surpassing those of the brilliant ages which preceded them. An inquiry into the particulars of this remarkable fact leads to a developement of one of the most curious and singular delusions which is to be found in the history of civilized man. I allude to the pursuits of Alchemy.

This ardent chase after an imaginary good, appears to have commenced with the Arabian philosophers; but the infection spread throughout Europe; and Italy, Hungary, Germany, France, Spain, Holland, Switzerland, and England, supply numerous examples of men who styled themselves adepts, or persons who, by sublime contemplations, had attained to a knowledge of the deep mysteries of nature, from the stars above, to the metals and other treasures, in the deeps below. A long account might be written, amusing in its details, of the manifold conceits, the solemn mystifications, the pious and ardent devotions, the rapturous expectations, and the appalling disappointments of those devotees of the hermetic art. Some of them, after being themselves deceived, practised gross deceptions upon the credulity of others; so that the name of this science became almost synonymous with hypocrisy and fraud. Yet it must be acknowledged that among the Alchemists, in different countries, there were men of truly estimable and honest lives, who would not willingly deceive others, and who appear to have been very cautious and scrupulous in their experiments, lest they should be themselves deceived. But such was the general darkness which covered the human intellect throughout that period, so glimmering the lights of philosophy, so deep the superstitions of the age, and so prone is ignorance, to mysticism, and credulity; it is not perhaps surprising, that men of scholastic acquirements, should be subject to these delusions, even so far as to suffer their imaginations to prevail over the testimony of their senses.

The grand desideratum of the Alchemists was twofold—to discover a powder of transmutation, which would convert any of the baser metals into gold,—and a universal elixir which was to heal all diseases, and prolong life to an indefinite period. But totally fruitless as were these long protracted labours, with regard to the main objects of pursuit, yet interesting and important were the discoveries which they made in the wide field of chemical research. Lord Bacon justly compares their efforts to those of a husbandman, who, searching for an unknown hidden treasure in his fields, diligently turns up the soil, and unconsciously gives fertility and increase to his possessions.

It was during this long period of mystery and inquiry that the processes and phenomena of distillation became known; some of the most useful of the medical compounds were discovered; and

the fact was ascertained, that the most active poisons are, under judicious management, the most useful medicines. Glauber, who was a German Alchemist, of the beginning of the 15th century, and who published about 20 treatises, discovered his salts, and thereby extended the practice beyond those simple herbaceous prescriptions to which the Galenical physicians had so much confined themselves. The treatise, in which he describes his discoveries, is one of the most enthusiastic productions ever published.

But a genius at length arose in England, whose penetration pierced the clouds of error, and detected the fallacies which had so long retained the world in subjection to the dogmas of the schools, and riveted the superstitions of the age. Lord Bacon's writings exhibit, as has been forcibly expressed, the first accurate map of the human mind. They taught the great and important lesson, that man can become the true interpreter of nature, only by a diligent search into her operations; that preconceived theories do but blind the understanding; and that the only avenues to truth are careful experiments and accurate observation. The world was not ready for the reception of the doctrines of this great man, and it was with much sagacity and judgment that he bequeathed his name and reputation to posterity, after some ages should be past. It is very possible also, that the accusation of bribery, which were preferred against him as Lord Chancellor, by his political enemies, may for a time have thrown serious obstructions in the way of his philosophy. It was this elevation of his intellectual and depression of his moral character, which have caused his name to be trnsmitted, with such dubious merit, to posterity,in the well-known couplet of Pope;

> "If parts allure thee, think how Bacon shin'd
> The brightest, wisest, meanest of mankind."

But impartial biography appears to have rescued the moral character of Bacon from much of the infamy which the violence of his opponents, and the temper of the age had cast upon it; and he stands before us as one of the most illustrious philosophers that has ever lived. "Mankind," it has been observed, "little know how greatly they are indebted to his great work, the *Novum Organon Scientiarum*, for the effects it has had towards producing many of the arts and conveniences of life. At one time it was thought to have a sort of

magic power to produce dangerous revolutions, subvert governments, and overturn the authority of religion. Even *he* was suspected of favouring *atheism*, who had eloquently published to the world, "I would rather believe all the fables in the Legend, and the Talmud, and the Alcoran, than that this universal frame is without a mind?" It might have been supposed, says the same reviewer, that any kind of tendency to irreligion, would have been the very last thing that could be imputed to Bacon's works;—but, such is prejudice. It is, in fact, a happy circumstance for mankind, that geniuses the most transcendent and original, that ever lighted upon our world, who have "thirsted the most ardently for knowledge, and have vindicated most boldly the freedom of the human mind from every yoke but that of truth, have been the farthest from meriting such a charge, in the writings they have left us. Such were Newton, and Bacon, and Milton, and Locke. The prejudices against the chancellor were indeed carried very far. One writer, Dr. Henry Stubbe, denounced the whole tribe of experimentalists, with the courteous epithet of a *Bacon-faced generation*, and says that he has small regard for deep and subtle inquiries into natural philosophy, and that we must rise as high in our resentments against the said generation, as the concerns of the present age and of posterity can animate us."

But happily the concerns of that, and of every subsequent age, have called loudly for the facts which have been brought to light by these experimentalists. "Lord Bacon's philosophical writings did not fail to make a strong impression on the learned world, both at home and abroad. The university of Oxford presented an address to him in 1623, (three years before his death) in which he is represented as a mighty *Hercules*, who had by his own hand greatly advanced those pillars in the learned world, which by the rest of the world, were supposed immoveable. This tribute to Lord Bacon's merit as a philosopher has the greater weight, because it was offered, as Macvey Napier remarks, when all motives to interested adulation had been done away by his lamentable fall! That the Royal Society of London, originated in the spirit of philosophical inquiry produced by Bacon's writings, cannot be disputed."*

Chemistry was among the first of the sciences which felt the benign influence of the Baconian philosophy. It was Bacon who first

* Library of Useful Knowledge.

assigned it its proper rank in the scale of natural knowledge, and in his masterly survey of human knowledge, pointed out its peculiar characters: he reviewed its history; investigated the causes which had obstructed its advancement, and suggested a number of investigations which he supposed might be successfully prosecuted.

The history of Chemistry, from this period, becomes more interesting. It began to enter into a more intimate alliance with other divisions of Natural Philosophy. Otto Guerick, who died forty years after Chancellor Bacon, invented the air-pump, and Boyle, who was his cotemporary, employed it in chemical as well as pneumatic investigations. Mayow, Hooke, and Ray, who also lived in the same period, were valuable experimenters, and gave an impulse to chemical inquiries. Becher, a German chemist, is one of the first who indulged in speculations founded on an experimental knowledge of facts; and his reasonings, though crude and unsatisfactory, furnished his countryman, Stahl, with the grounds of a theory which prevailed for nearly a century, and was the only reigning doctrine until overturned by Lavoisier and his associates in France. Stahl died in 1734. Boerhaave, who survived him but four years, presented the general doctrines of chemistry in a more systematic form.

Sir Isaac Newton, though not much of an experimentalist in this department of physics, turned upon it the light of his powerful mind, and by his suggestions relative to the nature of the forces which produce chemical action, rendered the investigations of others more scientific and intelligible.

The establishment of scientific societies about the middle of the seventeenth century, greatly conduced to the extension of exact knowledge by increasing the number of its votaries. Of these the most remarkable are the Academi del Cimento in Italy, the Royal Society in England, and the Royal Academy in Paris.

The invaluable discoveries of Kepler and Galileo, both of whom were the survivors of Lord Bacon, had broken in upon the superstitions of the age; and the institution of the Florentine Academy, nine years after the death of Galileo, seemed in some measure to redeem the character of Italy from the foul disgrace it had incurred in the persecution of that distinguished philosopher.

[To be concluded in our next.]

EDUCATION.

DISTRIBUTION OF THE PUBLIC REVENUE.

[The subject of the following communication is one of vital importance to every part of the community; it is from the pen of one of our most distinguished citizens—distinguished alike for his scientific attainments, his practical knowledge of business, and his unceasing endeavours to promote whatever is useful to the country.

We commend it to the notice of all who take an interest in the advancement of education, but especially to those to whom the people have entrusted the management of their national concerns.]

To the Editors of the Magazine of Useful and Entertaining Knowledge.

Gentlemen,

As the conductors of a Journal for the dissemination of useful knowledge, you will doubtless receive any communication which will awaken public attention to the subject.

To interest the General Government in any plan for the extension of knowledge, and to obtain for this object their powerful patronage, would be highly desirable. With these views the enclosed paper is offered for insertion in your widely circulated Journal. It was originally intended as a private communication; but, upon reflection, it has been deemed more advisable to give it greater publicity.

It is not supposed that the plan now proposed is the best that could be devised; but it is hoped that it may be the means of turning public attention towards the best mode of distributing the public money in such a way as to produce the greatest amount of happiness. The idea of securing a permanent fund for the promotion of education, first attracted my attention to this subject: the second part of the plan seemed to be a necessary consequence of the first, and in some of its details, may offer such advantage to enlightened statesmen, as may secure their powerful aid to the main object. Any mode of distributing the surplus revenue would be preferable to leaving it to be determined upon at the spur of the moment, when it might become a mere stalking-horse for political demagogues.

I am, &c.

D. K.

Letter to the President of the United States on the Subject of the Surplus Revenue.

Respected Sir,

The distribution of the surplus revenue, as you have stated in your message, is a subject surrounded with many difficulties.

These arise, as you have remarked, from the mode of distribution, and from the nature of the objects upon which it should be extended.

For the purpose of illustration, we will suppose that this surplus revenue is to be distributed immediately, and in this way we shall be enabled to present a view of the many evils which will, in all probability, accompany this annual disbursement.

The tables of Congress would be loaded with petitions, memorials, and projects from every section of the country, from States, from corporations, and even from individuals. Each would contend for their own favourite measure, and succeed, perhaps, in preventing other, and possibly better, plans from being adopted. The Halls of Congress would become the theatre of a fierce rivalry for dollars and cents, and members of Congress would be elected for the sole object of obtaining as much as possible of the spoil. Matters of public policy, and the general interests of the nation, would be neglected and sacrificed, to determine whether money should be expended on the Mississippi or the Connecticut. The States themselves would gradually enter into these feelings; and discontent, distrust, and discord would take the place of those generous sentiments which now pervade all the members of our happy union.

Nor will these be the only evils. Those States which are most powerful in Congress, will naturally unite together in taking to themselves the largest share of the money. No man could look forward to any office or public situation, from the humblest clerkship of a department to the presidential chair, unless aided by the patronage of a great State, or by the combinations which would be formed between the larger States. Office, thus obtained, would be wielded in every possible shape in favour of the appointing powers, and the most obvious principles of justice and equity would be neglected, or boldly set at defiance.

It we were to carry our examination no farther, we should still find enough to make every lover of his country start back with hor-

ror from this fearful picture. But when we add to all this the wanton and profligate manner in which this money would be expended, and the strong probability that every cent of it would be absolutely thrown away upon visionary objects, we are solemnly called upon, by every sentiment of patriotism, and even by the feeling of self-preservation, to devise some means by which such formidable consequences may be averted.

It is easy to foresee, that if some important principles be not previously settled, the annual distribution of large sums of money will become the subject of a thousand jealousies, a constant source of irritation and discontent, and, in the end, prove a curse instead of the blessing, which, if properly distributed, it will become to generations yet unborn.

As a citizen of New-York, of one of the most wealthy and powerful States of the confederacy, I feel it peculiarly incumbent upon me to suggest some plan by which the smaller and younger States should receive their utmost due; and that, while justice should preside over the distribution of this money, the rights and feelings of sovereign States, however small or young, should be scrupulously attended to and respected.

The ratio of the population of the respective States, would evidently be an unfair standard, because the smaller and younger States might really require more than the largest or oldest; and yet, by this ratio, they would in fact receive less. This subject will be recurred to in a subsequent part of this letter.

In the following outline or sketch, which I now proceed to submit for your consideration, it will be perceived that while the delicate and perplexing question of internal improvement is at once and for ever removed from the halls of Congress, every State will derive all the advantages to which she is fairly entitled from any system of improvement which she may be desirous of adopting. The unequal and unfair distribution by State population is avoided, and every sovereign and independent republic would be placed upon the same footing of equality.

It will, we take it for granted, be conceded by every one, that of all internal improvements, nothing can equal in value the benefits arising from a general diffusion of education. We speak not now of the universally acknowledged value of education to individuals,

which is paramount to every other internal improvement; but we allude to education as harmonizing with our purest and best republican feelings. It has been frequently observed, that education convinces the wealthy and proud, that the people should rule, and at the same time the people are convinced that the proud and the wealthy can in no way have any permanent advantage over them. The truth of these observations are so obvious, that they require no farther illustration. It is then for this pure and holy object I would propose that a part of the surplus revenue be especially consecrated; the remainder to be directed to other objects afterward specified.

It is proposed, that one half, or any definite part of this surplus be annually appropriated to Education. Let this be divided equally among all the States, without any reference to extent of territory, or number of inhabitants. Each State then would at once receive annually a sum of money varying from 50 to 200,000 dollars, to be devoted exclusively to the establishment of a University.

Every State in the union would thus have a UNIVERSITY *upon a more magnificent scale than any establishment in Europe*, even backed as they are by royal patronage, or supported by the accumulated spoils of centuries. These Universities, in the capital or chief town in each State, would have commodious and noble buildings, extensive libraries, costly apparatus, and liberal provision for the best instructers. By these establishments the most complete and finished education would be accessible to the sons of the poorest citizen in every part of the union. To this it may be objected, that the equal distribution of money would be unjust to the larger and older States. I answer, that a University in Rhode Island or Delaware, although located in these sovereignties, is not in fact, when considered in reference to education, a mere State establishment.

The boundaries of States on maps, though convenient for limiting jurisdiction, are, in this view of the subject, entirely ideal. A University in Rhode Island would, as a matter of course, attract students from Connecticut and Massachusetts bordering on its frontiers; and in the same way, the influence of a University in Delaware would extend to the adjacent counties of Pennsylvania and Maryland.

Again, with regard to the newer States in the west and south

These, from their recent settlement, and the consequent deficiency of population and capital, require an equal, if not a greater amount than than they would obtain by a mere population ratio. On the supposition then, that we had by these means twenty-four universities distributed over the country, all established upon a firm and liberal foundation, and placed beyond the remotest chance of failure, the imagination naturally looks forward to the immense amount of happiness thus secured to our posterity. The spirit of lofty and generous emulation among these national establishments, would be a sure pledge for their continually increasing activity and usefulness, and their accordance with our other free political institutions would prevent them from being perverted from their original destination.

Having thus endeavoured to establish the equal claims of all the States to an equal amount of appropriation for the purposes of education, I proceed to the consideration of the means of applying to other useful purposes the remaining part of the surplus revenue.

It would be irrelevant, Sir, in this place to discuss the necessity of other internal improvements, such as roads, canals, fortifications, rail roads, deepening the channels of rivers, &c.; or at least to enter upon the question of their expediency. The nation must and will have them; and the only plausible objection advanced against them is, the danger arising from the enormous patronage which any extended plan of improvement would throw into the hands of the general government, and the wasteful expenditures which would inevitably ensue. To obviate these and similar objections, it is supposed that the following plan might be successfully adopted.

The Governor and Council, or Senate, of each State to appoint one or more commissioners, to examine and report upon the improvement most required by the State, of greatest benefit to the people at large, and which would seem to require priority of attention. This report, accompanied with the requisite surveys and estimates, to be presented to the Legislature, and if approved by them, to be then laid before Congress.

That body would thus have before them, without the intervention of interested individuals, or political partisans, a fair and comprehensive view of all the improvements of primary importance which would require their more immediate attention. It would then be a comparatively easy duty to allot to each improvement such sums as

their relative importance would seem to require. All appropriations thus made, should be placed to the credit of the proper State authorities, to be expended for the specified improvements under their sole and exclusive direction. The dangers arising from the interference of the General Government would, I apprehend, be entirely removed by such a plan.

The smaller and more recently formed States might, it is true, in this way occasionally require a larger sum than they would receive if population was to be the measure of the amount. But as we have before had occasion to remark, public improvements are not to be estimated or measured by the ideal lines of State boundaries. A road or canal in a small State may be an important and necessary link in a great plan of internal improvement, connecting larger States. Thus, for example, although the money voted to New-Jersey for a rail road or canal from the Delaware to the waters of the Hudson, would seem to be disproportionate to her population, yet the larger States of New-York and Pennsylvania would almost exclusively reap the benefit of the appropriation. And in like manner, the younger States, from the recent date of their establishment, would absolutely require more expenditures for roads than older States; to say nothing of the advantages derived from bringing forward in a shorter time the public lands into market for sale. The sale of these lands, it will be recollected, is to form a prominent item in the future surplus revenue.

I could, Sir, expatiate longer on this subject; but enough has been doubtless said to direct the attention of the public to this important topic. It is not a mere party question, but one involving the comfort, the lives, the liberties, and the happiness of millions of human beings, through a long succession of generations.

With unfeigned respect,

I am, Sir,

Your Fellow-Citizen,

D. K.

COMMON SCHOOLS NO. II.

In treating of the modes of teaching pursued in our primary schools, the text books employed, as giving measurably a tone to instruction, should first be examined. They are necessarily as numerous as the different branches taught.

For the double purpose of avoiding confusion, and of confining the observations that follow within given limits, those on Arithmetic will alone be considered,—a science which, from its utility and importance in the practical concerns of life, presents the strongest claims to our attention ; and from the manner in which a knowledge of it is inculcated, a general defect in the system of early education may perhaps be most strikingly illustrated.

Encouraged by the PUBLIC, in most instances found sufficiently alive to whatever immediately and fundamentally affects its interests, Book-makers have glutted the market with a swarm of productions embracing the elements of the above-mentioned science ; liable, however, with few exceptions, to the objections that they are much better adapted to the comprehension of parents who are to purchase, than of the child who is to study them. Like the compiler of juvenile reading lessons, writers on Arithmetic seem to have erred, in supposing their productions addressed to minds mature and highly cultivated.

It requires no laboured argument to prove that an oration, or a sermon, that might with propriety be addressed to a conclave of philosophers, would be but poorly calculated to convince, or to persuade an assemblage of peasants. A plenitude of illustrations, in the latter case, might not only be indulged, but would be necessary, that in the former would not only be unnecessary, but offensive.

The reasoning that applies to the case of the philosopher and the peasant, applies *a fortiori* to that of the philosopher and the child. And the same principles that apply, in this case, to the composition of an oration, or a sermon, apply with equal force to the composition of Arithmetic rules.

In addressing a work to a college of mathematicians, a neglect of the maxim, *ne quid nimis*, might, irrecoverably consign its unfortunate author to the shelf of his bookseller. And in compiling a work for the use of children, too strict an adherence to the maxim

might prove equally calamitous, were men as keenly alive to the intellectual wants of children as to their own.

A man, whose mind has been enriched by knowledge, revolts at fulness of detail. The leading points on any subject, comprehensively stated, furnish him with a clue to the whole. Not so with the child; leading facts to his mind are, like isolated stars to his eye, without connexion. For him it is not sufficient that a fact should be stated, though in the simplest language. It must be amplified, and its attending circumstances set forth and explained. An instance will illustrate my meaning. "Sheep furnish food and clothing for man."

To one acquainted with the uses to which the flesh and wool of sheep are applied, this proposition is perfectly clear as it stands. But to a child, unacquainted with aught but the name, and appearance of the animal, it would be perfectly inexplicable. To his thorough comprehension of the idea; the killing of the sheep, dressing, cooking, and eating its flesh, shearing its fleece, spinning the fleece into yarn, weaving the yarn into cloth, dyeing, dressing, and making the cloth into garments would all be necessary circumstances.

The popular arithmetics of the day, instead of being based upon the plan which the forgoing remarks, if correct, would clearly indicate as the only correct one, are based upon one diametrically the reverse. The rules laid down in them, instead of being couched in a style sufficiently simple, diffusive, and explanatory, for the infant mind to comprehend, are rendered as concise as possible, and are generally given without a single comment affording a clue to the principles upon which they are based.

This studied brevity, far from being looked upon in its true light, has been deemed a desideratum in books of this description. And when their want of adaptation to the juvenile understanding has been urged, the objection has been answered by saying, "Allow the child to exercise his memory upon the language of the rule at present, and he will naturally eke out its meaning, and the principles upon which it is based, when his capacity shall have become sufficiently matured for that purpose." Thus reducing a science, of all others the best calculated to improve the judgment, and enlarge the mental capacities, to a mere collection of arbitrary signs for the exercise of the memory.

When such have to a great extent been the prevailing views, on

this subject and when teachers have, with few exceptions, practised upon these views, is it wonderful that the school-boy should so often prefer his Ball-club to his Book, and the rod of correction to his task.

Again, the almost endless multiplication of Arithmetic Rules would render the study intolerably onerous to any mind, in any great degree dependent upon memory for its power of conducting numerical operations. In Pike's Arithmetic, (for instance) an approved system, there are, under the rule of multiplication no less than nine cases, forming so many distinct, unexplained, and arbitrary rules to be memorized. Under the head of Practice in the same author, there are forty-four under that of Vulgar Fractions, they are, I had almost said, innumerable.

Now is it consistent to suppose that all these rules should be committed? To say nothing of their being treasured up, and kept distinct for years, to be drawn forth when the mind becomes sufficiently mature, and for the first time digested and understood.

Evidently not; rules when given, should be as few as possible in number, and those few should be distinctly and amply illustrated. Different modes of operating, and modes of abridging processes under the different rules are more properly subjects of illustration on the part of the teacher, and should never be thrown in, either with, or without illustration, swelling as they must to a discouraging size, a volume designed merely for the hands of a child.

If it be said that to this task, teachers are inadequate, it may as briefly be replied, that they are then inadequate to a proper discharge of the duties of their profession.

On a resort to first principles and a candid examination of facts, as connected with the experience of the past half century, it would seem that the expediency of attempting to teach children the FIRST principles of Arithmetic by written rules is at least questionable.

Arithmetic is an abstract science;—and abstract ideas, except so far as they are susceptible of the simplest explanation through the medium of sensible objects, are unintelligible to the juvenile mind.

Men of sufficient talents to write a book worth patronizing are too proud, or more charitably, do not fully appreciate the necessity of adopting a style sufficiently simple to meet the intelligence of the young. But did they feel this necessity, and did they limit

themselves in such a production to the proper developement of indispensable rules, the work would still be liable to the well founded objection, of being too voluminous and expensive, considered as a Class Book for children between the ages of four and ten years, (for it is contended that children can, between these periods, be taught the science of numbers with greater facility and more intelligibly than almost any other.)

But again; ideas never are, and from the nature of things, never can be made to mean as much on paper, as when communicated orally. This holds especially true in reference to instruction.

The advantage of oral over a written DISCOURSE, whether the object be to explain, or to persuade, are palpable.

Sounds, beside being the first mode of conveying ideas, have the adventitious aids of emphasis and gesticulation to render them more clearly intelligible. With these sounds children early become familiar, as vehicles of thought; and where the characters on a printed page would, at best, afford but a partial and imperfect clue to a chain of facts; oral communication would give these same facts both meaning and interest.

Most MEN soon tire of written DISQUISITIONS on abstract subjects, though couched in terms as simple and intelligible as the nature of the topics treated of may admit: for a stronger reason then, it must be allowed that a CHILD, constitutionally more volatile, would soon become fatigued and disgusted, with the task of prying into principles equally abstruse by means of signs with which he was but imperfectly acquainted.

Children are morbidly averse to any thing that requires deep, patient, and laboured investigation—their thoughts are excursive—their attention can be secured but for a brief period, and not at all, unless they can be interested, while they are instructed. For this purpose, oral instruction presents the additional advantage, that it allows a plenitude of illustration of which written language is by no means susceptible; and to an extent that distances all prospect of competition by other means.

For a work then, *introdutory* to the science of Arithmetic, to be used in common schools, a plan altogether PRACTICAL would seem the best. Let the book be made up entirely of examples—let the rules, if any are given, consist in directions to the teacher how to instruct,—not to the pupil how to learn.—Let the examples

adapt themselves as nearly as possible to the natural operations of the infant mind and to objects with which children are most familiar, whose value they are from infancy in the habit of estimating.

A child of four years might with the greatest facility, be taught the rudiments of Addition, by such sums, for instance, as the following—George bought an apple for two cents, a whip for six cents, and a top for a cent; how many cents did he pay? Of Subtraction, by examples of like simplicity—as, James had six cents, he gave three of them for walnuts; how many cents had he left?

A knowledge of the fundamental rules of Arithmetic might in this way, be inculcated and the study of the science be made an amusement rather than a task to the scholar.

Even the difficulties of the Rule of Three would vanish, when its principles were found to be embraced in examples like the following—If you can buy one apple for two cents, what can you buy twelve apples for?—Or again, if three apples cost six cents, how many cents will twelve apples cost?—On this last example the veriest child is readily taught to reason, that if three apples cost him six cents, one apple will cost him two cents, and that twelve apples will cost him twelve times as much as one apple, or twenty-four cents.

In a mode equally simple, and equally successful, every operation in Vulgar Fractions may be brought down to the comprehension of children; and in a manner so clear, that they are in a short time found competent to the *mental* solution of problems in fractions which would puzzle five-eighths of our Common Schoolmasters with slate, pencil, and rule at their command.

The examples given above, are of course to be considered as leading ones; and should be succeeded by others more complex, as the power of calculation should improve. Every example laid down, might be modified by the teacher in a thousand different ways, until the principles embraced in it should be rendered perfectly familiar.

The incalculable advantage of a plan like this, is, that it refers the pupil in the examination of problems to the dictates of common sense, rather than to the language of a written, and to him, enigmatical rule. It moreover induces early in the child, a habit of investigating the reason of things, sharpens his powers of discrimination, and in his general reading, in after life, renders him far less liable to be imposed upon, by the fallacious and demoralizing

doctrines of corrupt and vicious writers. With a public press possessed of an immunity bordering nearly upon license, and wielding a moral and political influence absolutely despotic, the foregoing consideration becomes of vital importance to the country.

As a very fair expose of the proposed plan, the reader is referred to "COLBURN'S FIRST LESSONS:" a little work which entitles its author to the gratitude and commendation of the public, both as a highly useful production, and as exhibiting a successful analysis of the operations of the infant mind.

But even Mr. Colburn's book is liable to the objection, that it has not in all respects followed out with sufficient strictness, the admirable plan upon which it is founded: as in the following example with its explanation in the key. "How many yards of cloth at three dollars a yard can you buy for fifteen dollars?"

The explanation given is, "As many times as three dollars are contained in fifteen dollars, so many yards of cloth may be bought for fifteen dollars." Suppose the dollars instead of fifteen had been laid at seventeen.—By the division there would then have been a remainder of two, which the child would at once have named two dollars; and in larger operations, though the character of such remainders might have been repeatedly explained, he would still be likely to find in them a fruitful source of doubt and perplexity.

By adhering strictly to the inductive method, this difficulty is obviated. Thus, if one yard be three dollars, one dollar will buy one third of a yard, and seventeen dollars will buy seventeen times as much, or seventeen thirds of a yard. How many whole yards? The child answers at once, a yard for every three thirds, or five yards and two thirds of a yard.

This method of illustration in all examples of a similar nature to the one just quoted would considerably improve this little work.

In subsequent editions, which will certainly be called for, it is confidently believed, that the author's experience will induce its adoption. It is proper to remark, that the introductory part of a plan, like the one suggested, should be succeeded by a sequel adapted to the enlarged capacity of the pupil for acquisition; but whether this sequel should comprise rules with an exposition of the principles upon which they are founded, leaving it chiefly to the ingenuity of the teacher to supply examples adapted to the different rules, or aim at teaching mainly by example, as in the sequel of Colburn,

would perhaps be unimportant to determine, were our primary schools generally supplied with competent instructers. Under existing circumstances, the writer inclines to the idea that a work, combining the demonstrative system of La Croix with the more practical one of Colburn, would be best adapted to subserve the wants of the public.

So much for books.

In regard to teachers, it is hard to speak, and as hard to be silent. That they are in a vast majority of instances unqualified, is no longer open to debate. Who is to blame for this? Surely not the teachers. They are hired to do a sixpenny job, and well would it be for the public did their labours always render a sixpenny profit;—but the misfortune is, that poor TEACHING, like poor preaching, in one respect too much resembles a minus quantity in the mathematics; it indicates rather an ultimate loss than an ultimate gain.

The limits of this essay do not, however, admit a plenary examination of this branch of the subject. It is therefore dismissed with the intention of making it the subject of a future paper.

NATURAL HISTORY.

THE HAND-TREE.

Cheirostemon platanoides.

The expedition of naturalists which was sent by the Spanish government to explore their possessions in South America, first discovered the Manita or Hand-tree, as it was called, in the year 1787. The only tree which was found, was observed near Toluca, a small town of Mexico, growing in an arid, stony, mountainous situation, where the agave and a few annual plants, but no other shrub or tree was detected. Only one individual of this tree was discovered at that time, and it seemed to be regarded by the simple natives of that district in a superstitious light, as an object of

veneration. The Spanish botanists who were struck with its beauty, and the curious structure of its flower, and were anxious to procure living specimens for the purpose of transporting them to the royal gardens of Madrid, were informed by the Indians that the tree was an object of favour with their Deity, who had decreed that no other individual should exist, and that their labours to propagate new ones by seed, or by grafts or planting shoots, would prove for ever ineffectual. Notwithstanding the care bestowed by the Spaniards for this purpose, it seemed, at the time, as if the fate predicted by the natives had been imposed on it, since they were unable to procure new plants from it. Since that time however the Hand-tree has been discovered by naturalists, and particularly by Humboldt, and his associates, in several other parts of South America, and the curiosity of travellers has frequently supplied collectors of natural objects with specimens of the flower and fruit. Several such specimens exist in the cabinet of the Lyceum of Natural History preserved in spirits, and we have noticed living plants of the young tree in the greenhouse of Mr. Prince at Flushing.

The Hand-tree usually grows to the height of 40 or 50 feet, branching like the plane-tree, in the leaves of which there is a great resemblance, from whence the specific name is derived. The flower at first is like the tulip in form, but when its five segments have expanded it assumes a bell shape. These petal-like segments are considered as belonging to the calyx, there being no other corolla. There are three small leaflets at the base of the flower, which fall off when it has blown. The peculiarity which gives name to the tree resides in its stamina, which are united below into a tube, while the filaments diverge upwards, are pointed at their ends, and curve in one direction, so as to bear the resemblance of a bird's claw. The anthers are seated on the back of these filaments. The pistil protrudes through the tube formed by the union of the filaments, and is tapering like them, and curves in the same manner. The figure which is given of it above, exactly represents its shape and habit, reduced to one half its natural size. In the Linnæan system, its belongs to the class monadelphia, or those in which the stamina are all connected into one, while it ranges in the natural method, among the mallows, althea, &c. The fruit is a capsule exactly like that of the ochra—the common garden esculent. It is said to possess some medical virtues similar to the rest of the mallow tribe, its juice being emollient and laxative. The wood is soft and of no apparent use.

The flower is not very striking from its colour, which is a dark dull purple. It continues in bloom for a long time, and the tree, as is frequently the case in tropical plants, is often observed to be decorated with flowers and fruit at the same time.

To the Editors of the Magazine of Useful and Entertaining Knowledge.

Gentlemen,

Having in the course of my chemical investigations had occasion to analyse various ores, I beg leave to offer you some remarks on them, beginning with platinum, which if they contain any thing of interest, are at your service.

Yours, &c.

LEWIS FEUCHTWANGER.

ORE OF PLATINUM.

By Dr. Feuchtwanger.

Platinum, or Platina, as it is sometimes written, was first discovered in the year 1741, and was recognised as a metal in 1754, by Dr. Lewis. It occurs in South America, in Brazil, in the Capitanery of Matto Grosso and Minas Geraes, in new Granada, the provinces of Choco and Barbacoa; St. Domingo at the Jacky River; in the Uralian mountains in Siberia; in Spain, it is contained in the silver ore of Guadalcanal. It is obtained in grains, by washing it out of the sand in which it always is found. It is usually accompanied in these grains by other metals, such as Palladium, Rhodium, Iridium, and Osmium. These metals are inoxydizable by fire, while the grains of Platinum, which are sometimes of a six-sided or hexaedral form, are infusible; and it becomes necessary therefore to resort to a process which is often tedious and difficult, to obtain the pure platinum. This process is usually at first to dissolve the grains in nitro-muriatic acid, then to precipitate the solution with sal ammoniac, and calcine it for the purpose of procuring the platinum in a state of powder. The means of rendering it massive and malleable, was for a long time a problem which the ablest chemists of Europe were unable to solve. The celebrated English chemist and mechanist, Dr. Wollaston, discovered a method which was effectual for this purpose, and which was kept secret until shortly before his death. Several other chemists, such as Count Moussin Pouschkin, Pelletier, &c. have recommended ways of rendering the platinum malleable, but in all these, the powder obtained by the ammoniated platinum, was combined with other metals, such as mercury, arsenic, phosphorus, &c.; but no method is equal to that of Wollaston. I shall merely state, that he did not find it necessary to use another metal for melting it, but he pressed the spongy platinum in a brass cylinder,

applying the greatest force of a machine invented by him for the purpose. After having finished this process, he obtained a cake of the platinum metal, which he then heated gently to a red heat, and brought it to a forge fire, and increased the heat to the greatest degree for twenty minutes; the cake is then taken out and laid on an anvil, and while still hot is beaten and worked with a heavy hammer, and the metal then becomes completely malleable and may be converted into wire, foil, or other forms.

South America yields comparatively a small quantity of this metal, about 900 lbs. being yearly brought to Europe from that continent, but from Siberia in 1827 was obtained 1000 lbs.

1828	"	6400
1829	"	6500
and in the first part of 1830	"	2440

The price which it usually bears at Petersburg and Paris for the raw metal, is $1 25; and for the refined and prepared in foil or wire, $5 to 6.

Notwithstanding the quantity has been much increased since 1827, the value has not much diminished; one reason of this is, that the Russian government usually pays the salaries of the officers employed in the discovery and preparation of the metal, in coins made of platina, which are of less value than of gold, and only current in the country.

From the peculiar characteristics of Platina, it is superior to all other metals, for various chemical and philosophical purposes—when refined, it is the heaviest of all natural bodies: its

specific gravity is	- -	21, 23,
while that of gold is	- -	19, 27,
and " silver,	- -	10, 47.

Though harder than either of these metals, it is very malleable. It is almost infusible, and requires a very powerful heat to melt it. Like iron, it possesses the property of welding, that is, when separated, of adhering under the hammer when operated on while at a white heat. It is not at all changed by exposure to the air, and no simple acid will act upon it. In order to dissolve it, it is necessary to unite the nitric and muriatic acids.

It unites with most other metals, and forms some valuable alloys with several, such as copper, silver, &c. It may be hammered into leaves of extreme thinness, and Dr. Wollaston has succeeded in producing wire from it of $\frac{1}{3000}$ of an inch in diameter. The most delicate test for discovering the presence of platinum is muriate of tin. When the metal is dissolved in any liquid, even the smallest distinguishable quantity is readily detected by an alkali,

as potash, or ammonia, or a single drop of the solution of tin, which renders the liquid a bright red colour.

One of the most remarkable properties of platinum is, that in its state of powder or sponge, it determines the hydrogen gas, when brought in contact with it, to combine with the oxygen gas of the common atmospheric air, and to kindle the mixture of both these gases, and to form water; from this property, has the construction of the hydrogen or Platina lamp its derivation; they are in Europe and this country so well known and in such common use, that they require no further explanation. In an economical point of view, the dynamic power of the oxydated sulphuret of platina and suboxide of platina present the most interesting combinations; they convert alkohol, when brought in contact with them, either as liquid or as vapour into the purest acetic acid, which, when diluted with a sufficient quantity of water, yields the best vinegar.

There have been lately introduced, small machines, called Platina Perfuming Lamps, which consists in glass bulbs covered with metallic platina in the thinnest possible state, produced by the reduction of the muriate of platina in alkohol; the stem of the bulb, with a wick coiled around it, is placed in a vial containing a perfuming fluid, so that if the wick is kindled for one second, and then the flame put out again, the platina continues to glow, and the perfuming fluid is in this manner continually drawn up by the wick, consuming slowly, and emitting the most agreeable perfume. By this means we can use any fluid whose aroma we wish to enjoy.

Another highly interesting property of the platinum is, that if the positive pole of the galvanic electricity is brought to act on a platinum surface, through a solution of sugar of lead, it will represent the colours of the rainbow perfectly concentrical, and with an indescribable splendour.

SCHOOLS, SOCIETIES, &C.

ELLINGTON SCHOOL.

The very beautiful frontispiece to the present number presents a view of the local situation of one of the best schools within our knowledge; a brief account of which will be found below. We have given this account, in pursuance of our design of noting such schools in the different parts of the country, as we deem worthy the particular attention of those who are desirous of placing their children under the charge of competent teachers, and of locating them in healthy and agreeable situations.

This School is situated in the town of Ellington, in Tolland County, Connecticut. In the centre of the town is a small village, containing a handsome church, a school-house, and about thirty dwelling-houses, which are, in general, handsomely built. The village is about fifteen miles N. E. from Hartford, on the eastern side of the valley of Connecticut river, and at the foot of the hills which skirt this valley on the east.

The soil in the centre of the village is alluvial. On the eastern side the hills commence with the transition, and terminate in the primitive formation, in which gneiss predominates. On the western side the land is gently elevated, and consists of red sandstone. These several varieties of soil are fertile, and well adapted to the growth of all such vegetables as are natural to the climate. The *rye* which grows here is noted for the superior excellence and whiteness of its flour.

The site of the village is an oblong amphitheatre, having its greatest extent from North to South. To the eye it has the appearance, and is nearly so in fact, of being entirely enclosed on every side by elevated grounds, with the greatest elevation on the east.—The contour of the hills on the east, as viewed from the rising grounds on the west of the village, has a very pleasing effect. The summits of the former are gently undulating, covered entirely with trees and vegetation, exhibiting to the eye richness and beauty, rather than grandeur and sublimity. From various positions on these hills are presented magnificent views of the great valley of the Connecticut. Some of these positions overlook a territory not less than eighteen hundred square miles in extent, interspersed with churches, villages, and houses, in almost every direction.

The building for the school,* which is situated on slightly elevated

* See frontispiece.

ground, commanding a delightful view of the village, consists of the middle, or main building, which is fifty-two feet long, and three stories high, with a basement story underneath; and of two wings, each of which is two stories high, having also a basement story below. The whole length of the building, including the two wings, is 128 feet. The interior is divided into convenient apartments for the accommodation of the Superintendent and his family; for dormitories for the students; for dining-room, kitchen, school-room, lecture-room, &c. Attached to the institution, are five acres and one quarter of land, for a garden and play grounds.

The students live together in the building which has been mentioned, where they constitute one family under the care and watch of a Superintendent, and other suitable persons. The Superintendent, and most of the Instructers, live with the students, eat with them at their meals, and are at hand to watch over their behaviour. If the pupils bring with them bad propensities of any kind, pains are taken to eradicate them, and to substitute good ones in their place. Much attention is paid to giving the lads correct moral sentiments, a manly deportment, kind feelings towards each other, and habits of industry and economy. They are also required to take proper exercise, to promote their health, and give vigour both to their bodily and mental faculties.

The branches taught are reading, spelling, penmanship, English grammar, composition, geography, elements of history, mathematics, natural philosophy, the Latin and Greek languages, elocution, and such, generally, as are included in a good English education, or are preparatory to admission into any of our American Colleges. The instruction is of the most thorough kind, and conducted so as to expand and discipline the mind, and to teach it how to use the ideas which it acquires.

The Principal furnishes tuition, superintendence, room, bedstead, board, washing, fuel, and lights, for $150 a year; and in that proportion for a shorter time. Parents may provide their own beds and bedding, or he will furnish them at the rate of five dollars a year, if the pupil lodges alone; or for four dollars, if he lodges in company with another.

The pupils are not allowed to have any money in their possession, nor to incur any expense without the consent of the Principal, or one of the Instructers. At the close of each term a particular account of the expenses of each scholar, is rendered to his parent, or guardian.

The Principal reserves to himself the right of dismissing any scholar, for incurable dulness, or incorrigible misbehaviour.

The following is the present list of the Principal and his associates.

JOHN HALL, Principal.
ZEBULON CROCKER, Superintendent.
LUTHER WRIGHT, Instructer in the Greek language.
JULIUS A. REED, Instructer in Mathematics.
ORLAN GLAZIER, Instructer in English branches.
ARIEL PARISH, Instructer in Penmanship.

The Principal instructs in Composition and Elocution, and the Superintendent in the Latin language.

USEFUL ARTS.

NEW MODE OF OBTAINING INDIGO.

AT a meeting of the Academy of Sciences of Paris on the 30th of August last, M. Chevalier communicated a process which he has discovered, whereby the Indigo used in dying blue cloth, may be extracted from shreds and clippings, and even scraps of old cloth, still retaining the colouring principle. M. Chevalier subjects the fragments of cloth to the action of a solution of caustic soda, which he boils till the whole is reduced to a saponaceous solution, in which the indigo is held in suspension, and may be withdrawn by filtration.

Asiatic Jour.

BLUE COLOUR.

THE straw of Buckwheat, when properly prepared, yields a blue colour. The following is given by the New Monthly Magazine, as the process of preparation. The straw should be gathered before the grain is quite dry, and placed on the ground in the sun, until it becomes sufficiently dry to be taken from the husks with facility. The wheat having been removed, the straw is to be piled up, moistened, and left to ferment until it is in a state of decomposition, when it will become of a blue colour: this indicates the period when it should be gathered, and formed into cakes, which are to be dried in the sun, or in a stove. On these cakes being boiled in water, the water assumes a strong blue colour, which will not change either in vinegar, or in sulphuric acid. It may, however, be turned into red with alkali, into a light black with bruised nut-galls, and into a beautiful green by evaporation. Stuffs dyed blue with this solution, which is to be used in the same way as vegetable matters of a similar species employed in dying, become of a beautiful and durable colour.

NEW TELEGRAPH.

A NEW telegraphic system has been invented in France, by M. Ferrier de Draquignan, who proposes to organize a line of communication between Paris and Havre. By this invention it is said that a despatch, containing several lines, would traverse a distance of several hundred leagues in a few minutes. The system is to be at the service of the public, like the post-office, which will be of immense importance to the commercial world. Several experiments have already been made by persons appointed by the government, and they are said to afford every prospect of the success of the plan.

SILVER SOLDER.

GENTLEMEN;—I take the liberty of calling your attention to the article Solder, which you must be aware is of great importance to a numerous class of workmen in metals. I have examined the Encyclopædia Britannica, and some other books on this subject, in search of a particular silver solder, but could never find it. The solder I allude to runs very easy, and is very nearly as white as silver, so that the joining can hardly be discovered. It is used in the manufacture of tea-plate ware at Sheffield, &c., but would be useful for many other purposes, were it generally known, especially to silversmiths. Having made several experiments to discover a solder of this description, I send you the most successful, as the solder obtained by it runs easy, and may be useful for some purposes, particularly when used near another soldered part. It is not, however, so near the colour of silver as that I have mentioned.—Take 1 oz. of pure silver, 1 oz. of spelter solder (such as is used by braziers,) and nearly two dwts. of grain tin, and melt them in the order stated. The rolling must be very carefully performed, and the solder must be frequently annealed, as it is very brittle. I have made some other trials with arsenic, but have not been able to pursue them to a satisfactory result. If any of your correspondents know the component parts of the Sheffield solder alluded to, and would have the goodness to communicate it, I am sure it would oblige many.

Mech. Mag.

TO EXTRACT GREASE-SPOTS FROM CLOTHES.

Spirits of turpentine are frequently used for this purpose; but in clearing one spot by this process, we have often found, to our sorrow, another in its place, deeper and broader. Highly rectified alkohol is now recommended. The mode of using it is this: a small piece of sponge is wet with it, and rubbed upon the spot until quite effaced, and the cloth is nearly dry. In this way grease-spots can be taken out from various kinds of silk, from cloaks, from carpets, from the collars of coats, &c. If the alkohol be good, and the application judiciously made, the instances of failure will be comparatively rare. When the garment can be washed, good soap and soft water will uniformly succeed in common grease or oil spots; but if any rosin or wax be present, alkohol is indispensable.

Another Method, from a Correspondent.

Take half a pound of fuller's earth, make it hot through; whilst hot, pour as much cold water upon it as will make it quite wet; set it in an oven to dry; then wet it again, and dry it as before. When dry and cool, add of rectified spirit of wine and spirit of turpentine, one ounce and a half each. Mix the whole with a spoon until quite smooth, and put it into a bottle, and cork it close. When you use it, rub it on the grease-spot with your finger; let it lay on until dry, when it is to be rubbed off with flannel.

Ibid.

WRITING INK.

The ink in common use is composed of nut-galls, green copperas, or sulphate of iron, log-wood chips, and gum arabic, infused either in rain-water or vinegar. In this composition the colour principally depends upon the chemical union between the infusion of galls and the green copperas, or sulphate of iron; and, indeed, by way of experiment, ink may be made by this means without the addition of any other ingredient. It may, however, be observed, that all the other ingredients are vegetable substances, and consequently liable to decomposition by the action of time and air; leaving only the sulphate of iron, which, having a metallic base, remains unaltered. To prove this, we know, by experience, that the legibility of decayed

writings may be restored, by washing them with an infusion or decoction of galls in wine. This demonstrates that the chemical properties of the sulphate remain unaltered. There have been instances, however, in which the very operation of the copperas has made holes in the paper wherever the pen has traced. The desideratum, then, with regard to the ink employed, appears to be, to produce a fluid of equal intensity of colour, composed of such chemical ingredients as will not change by time, exposure to the atmosphere, or the action of damp, to which the decay of many old writings may in a great degree be ascribed.

In a modern work, entitled "The New Family Receipt Book," the following is given, which is professed to be indelible :—

"Boil one ounce of Brazil wood, with twelve ounces of water, and half an ounce of alum, till reduced to eight ounces; and then add one ounce of the black oxide of manganese, reduced by decantation to extreme fineness, and half an ounce of gum arabic. This cannot be effaced by oxygenated muriatic acid."

In this ink the galls are omitted, but the dying-wood retained, and the place of the sulphate of iron or copperas is supplied by the black oxide of manganese. The alum, from its astringent quality, appears to be substituted for the galls. The gum arabic is added, as in the common ink, to keep the pulverized particles in suspension.

In this composition, from the union of the mineral substances, on which, in a great degree, the colour depends, it seems probable that it would remain unchanged by time and the operation of damp. Thus it possesses a superiority over the ink in common use, while it is free from the corrosive effect often observed to accompany the sulphate of iron.

Ibid.

TO MAKE AMBER VARNISH.

TAKE one pound of powdered amber, melt it in an unglazed vessel over a charcoal fire, and pour it, whilst a fluid, upon an iron plate; powder it again when concreted, and afterwards dissolve it entirely in an unglazed vessel, adding to it first linseed oil, prepared and boiled with litharge, and secondly, spirits of turpentine. With this incrust rub your vessels of wood or metal, and when carefully dried, polish them well. *Ibid.*

MISCELLANY.

GOVERNOR CASS'S ADDRESS.

The Address of Gov. Cass, delivered before the Association of the Alumni of Hamilton College, in August last, has been lying on our table for some weeks, and we have read it with equal attention, pleasure, and profit: it is one of the most finished productions of the kind with which we have ever met. The style of the author is highly polished; his remarks just, his disquisitions profound, and he occasionally pours forth strains of impassioned and soul-stirring eloquence. The subject selected for the occasion, was one of vast importance, and one that could scarcely fail to be interesting even in less able hands; it is the contemplation of the "progress which society has made, and the prospects it offers." We shall gratify our readers with some extracts from this excellent production. "The fortunes of nations," says the Governor, "as well as of individuals, are committed to themselves. And where government is a deposit intrusted to all, all are accountable for its faithful administration, and all should investigate the causes which give it stability, or accelerate its downfall."—"We are deeply interested in the operation of those causes which can meliorate the condition of mankind, either in their social, political, or moral relations; which can add stability to our institutions, prosperity to our country, contentment to our citizens. And of all these causes, the progress of knowledge is the life-preserving principle; not its advancement merely in the various branches of human investigation, whether active or speculative, but still more its general diffusion among all classes of all nations." "Upon this foundation, (Knowledge and Education,) the great fabric of freedom must rest; and more fortunate than those who erected a monument of folly upon the plains of Shinar, we may hope that it will be a tower of refuge for our country, should the fountains of power be broken up and descend upon us."

The following is a beautiful eulogium on the importance and value of the Press: we wish we could say that it is in *all* cases merited: "In the diffusion of political information, the periodical press is the great instrument of modern times. The wish of Archimedes is realized, and a place is found where the work can be moved. Only a century and a half has passed away since the introduction of newspapers—they are now the repositories of all that is important in the progress of human affairs, and much of that is

valuable in science and in literature. Their duration is now beyond the reach of fraud or force. In republics they are the safeguards of freedom; in monarchies, they are jealous sentinels, prompt to discern, and fearless to announce approaching danger; and in all governments, they are the nerves which convey sensation through the political body."

After taking a brief view of the effects which the general diffusion of information are producing on the various nations, not only in Europe, but in Asia, Gov. Cass remarks, "Nor can we be indifferent to the progress of the fortunate soldier who sits upon the throne of the Pharaohs. Centuries of darkness and servitude have rested upon the land of the Nile, the cradle of the arts and sciences; it has long been their tomb. Even here the light of knowledge is penetrating; and its pyramids may yet be gilded by the setting rays of the sun of science, as in the infancy of the world they were gilded by its rising beams."

"And Greece, too, is awakening from the slumber of ages. She has cast from her the incubus of Turkish despotism, and is again displaying that standard which triumphed at Marathon and Salamis. And who has not deplored her sufferings, and rejoiced at her emancipation? And what prouder triumph have knowledge and science ever gained, than the imperishable fame which the deeds of her statesmen and warriors, the works of her artists, and the productions of her poets, and historians, and philosophers, have conferred upon the land of Homer, of Aristides, and of Epaminondas?"

"And in our own hemisphere, this great moral agent is proclaiming from the summit of the Andes the value of free institutions, and is teaching the descendants of Montezuma and the Incas, that where political knowledge begins, political servitude ends."

"But it is not alone upon the political institutions of the various nations of the world, that knowledge and education are exerting their power. They are breaking down the Chinese walls, which ignorance and prejudice have erected, and are bringing each to the knowledge of all. Mutual forbearance must be the result of this new spirit of intercourse. Something will be seen in all to approve; something will be felt in each to condemn. Nations have been separated by almost impassable gulfs. If prejudices are cast into these, they will close, as did that fearful chasm which yawned beneath the fortunes of Rome, until her generous deliverer leaped into the abyss. Enterprise and commerce are stimulating all to exertion, and every portion of the habitable globe has been explored. The causes of war are decreasing, and the desire to engage in it by princes and people diminishing. Ambition, indeed, is as reckless as ever, but no future warrior will reach an Indus beyond

which there are no worlds to conquer. And national glory is a meteor, yet mistaken by many for the fountain of light. National glory! The glory of destruction, and not of preservation; of want, of suffering, of misery, and not of abundance, of enjoyment, of prosperity; of death, and not of life. We may hope that this splendid pageant is passing from before the eyes of mankind. It will leave impressions not less sad than salutary. But although some of the more prominent causes which have produced the hostilities of nations, are yet in operation, and may long continue to be, still, many which owed their origin to the follies and passions of rulers, have disappeared before the advancing opinions of the age. We may well doubt whether another gun will ever be fired, because a squadron of ships sails the ocean with a broom at their mast head, or because a Dutch statesman consults his vanity, rather than his good taste, in the subject of his pictures; and another night must rest upon the human intellect, before the nations of Christendom will precipitate themselves upon a distant and desolate region, to recover a ruined city and an empty sepulchre. The responsibility of governments has increased, and so has the publicity of their proceedings. The spirit of free inquiry enters the cabinets of princes, and checks, if it does not control, their measures. A single glance at the present state of Europe, will convince us that its governments are engaged in a course of discussion and action, which will constitute the harbinger of a brighter day. The melioration of their institutions, the reduction of their expenditures, the introduction of the representative system, the establishment of charters, with pledges and limitations—these are among the triumphs of knowledge which Continental Europe is now exhibiting. All the promises, indeed, which in that hour of danger and deliverance, when confederated nations proposed to cross the Rhine, were liberally, and we hope honestly made, have not yet been redeemed. But the time of performance is approaching; glorious in itself, it will be still more glorious in its consequences.*

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"It is certain that the comforts of life by the modern constitution of society, and by the improvement of the arts, are greatly increased and extended; and if the contrast be pursued into those periods which witnessed and succeeded the decline of the Roman empire, and which are stamped with the name of the *dark ages*, this superiority is yet more manifest. The picture of manners which this twilight of the human intellect enables us to discern, has little to

* This was written previous to the reception of the news of the late revolution in France, and seems to have been prophetic of that event.—[*Editors.*]

approve and less to attract. The houses made with posts and wattles, a fire kindled in the midst, with the family cooking around it, and the smoke escaping as it might, but without the aid of a chimney—this sketch of ancient English life seems the very model of the domestic circle of our own nomadic tribes.

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"We cannot look around us within the interior of our dwellings, nor without, and not be sensible of the improvement which has taken place in every branch of the useful arts; in those which produce, in those which prepare, and in those which distribute the comforts of life.

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"The mysterious law which gives polarity to the needle, was fortunately discovered, while a spirit of maritime enterprise was attempting to pass the geographical barriers which from the creation had concealed one half of the world from the other. The ancient navigator crept slowly along the coast, afraid to lose sight of the land-marks which could alone guide him upon his course; and when he was compelled to abandon these, his fate was committed to the winds and the clouds. The modern navigator boldly seeks the ocean, and when the night and the storm close around him, his path is marked out wonderfully, indeed, but easily and unerringly. The shore was the safety of the one, it has become the dread of the other. No Palinurus, like him of old, now stands at the helm, to watch the stars, and when they are shrouded from his view, to confess his ignorance and despair.

> Ipse diem noctemque nigat discernere cœlo,
> Nec meminisse viæ mediâ Palinurus in undâ.

A better star than Orion or Arcturus now shines upon those who go down to the great deep in ships.

"The application of glass to some of the objects of science, has brought within the sphere of human observation, works of nature the most remote, as well as those the most minute. Its agency in the renovation of our decaying sight, is not less valuable, preserving for us until the extremity of life, that intercourse with books which is a principal solace of advancing age.

"To him who, ignorant of the discoveries of modern astronomers, surveys the heavens which encompass us, the stars that deck the firmament seem placed there to give brilliancy and splendour to the night; to roll over us in endless confusion, but in endless beauty. How different is the view which the theory of astronomy presents. The seeming confusion of these splendid orbs becomes perfect har-

mony, their motions are traced, the laws that regulate them developed, and those composing a part of our solar system, are found to be kindred planets with the earth, running the same course, and probably destined to the same service; while those beyond are themselves suns, and centres of other systems, having other heavens within their view, whose astral light has never reached us, and never may.

"There is nothing within the whole range of human imagination, which so forcibly impresses upon us just conceptions of the infinite power of Him who made, and preserves, and may destroy these works of his hands, perhaps for purposes unknown to us, and to be replaced by others, as these may have succeeded a more ancient creation. The telescope has drawn these works towards us. It has shown that points of matter, many of them scarcely visible to the naked eye, are among the most stupendous works of Providence; while a kindred instrument has revealed to us a world of animated beings, near us indeed, and around us, but utterly unknown till the invention of the microscope. Where these discoveries are to end no man can tell. Already have we passed the boundaries prescribed to unassisted nature, and brought the greatest and smallest, the nearest and most remote of God's works, within our view. We may yet ascertain that many portions of matter, apparently inanimate, are congeries of living beings, performing the functions assigned to them, and each enjoying his allotted share of happiness."

We have already drawn largely from this admirable and interesting "Address," but we cannot leave it without presenting our readers with one more extract.

"We have found in steam, an agent which seems destined to produce greater changes in the condition of society, than any other improvement since the invention of printing. Nothing is too mighty for its power—nothing too small for its skill. With admirable adaptation of machinery it pursues its operations, which, in their regularity, facility, and certainty, seem the result of active intelligence, rather than the operations of a complicated engine. It prepares the materials of our dwellings, the food that we eat, the clothes that we wear, the money that we use, the books that we read. It is extending its efforts and effects into every branch of the arts. It is descending the mines, and ascending the mountains; drawing treasures from the bowels of the earth, and distributing them to every land. Far mightier in its powers, as well as more versatile in their application, than the ship of the Arabian desert, the steam engine is becoming the ship of the ocean and the land; propelling the bark and the car wherever industry can find employment, or enterprise its reward.

"To the genius of our countryman, Fulton, we owe the practical application of this power to the purposes of navigation; and no man can appreciate its value to this country, and especially to the western portion of it, unless he has seen, as I have done, the difficulties which formerly impeded the ascent of vessels upon the Mississippi and its mighty tributaries; unless he has seen the slow and toilsome progress of the keel-boat, requiring the labour of thirty men, and almost half a year, in a voyage from New-Orleans to Pittsburgh. Future skill and enterprise will hereafter vanquish the difficulties which yet exclude steam vessels from many of our considerable rivers; and the wandering Indian is perhaps destined to see them pass his most solitary village—the terrific *Manitou* of the white man.

PAPER LINEN.

A new invention, called paper linen, has lately been invented, and extensively used in Paris. It consists of paper, made to resemble damask, and other linen, so closely that it is impossible, without examination, to detect the difference: even to the touch, the articles are very much alike. They are used for every purpose to which linen is applicable, except, of course, those in which strength and durability are required. The price is very low: a napkin costs only about two cents; and when they become dirty, are taken back at half price. A good sized table-cloth can be obtained for about eighteen cents.—*For. Jour.*

PROPORTION OF POWER TO VELOCITY IN STEAM-BOATS.

The following table of the power necessary to give a steam-boat different velocities, has been published by Mr. Tredgold:—

3 miles per hour	5 horse power.
4	13
5	25
6	43
7	69
8	102
9	146
10	200

EXTRAORDINARY BED-RIDDEN MECHANIC.

In the town of Alyth, in Scotland, there lately lived a man of much provincial celebrity, of the name of James Sandy. The originality of genius, and eccentricity of character which distinguished this remarkable person, have been rarely surpassed. Deprived at an early age of the use of his legs, he contrived, by dint of ingenuity, not only to pass his time agreeably, but to render himself a useful member of society. He soon displayed a taste for mechanical pursuits, and contrived as a workshop, a sort of circular bed, the sides of which being raised about eighteen inches above the clothes, were employed as a platform for turning-lathes, table-vices, and cases for tools of all kinds. His genius for practical mechanics was universal. He was skilled in all sorts of turning, and constructed several very curious lathes, as well as clocks, musical instruments of every description, no less admired for the sweetness of their tone, than the elegance of their execution. He excelled too in the construction of optical instruments, and made some reflecting telescopes, the specula of which seem not inferior to those furnished by the most eminent London artists. He suggested some important improvements in the machinery for spinning flax; and was the first who made the wooden-jointed snuff-boxes: those called Laurencekirk boxes fabricated by this self-taught artist, were purchased and sent as presents to the royal family. To his other endowments he added an accurate knowledge of drawing and engraving, and in both these arts produced specimens of great excellence. This singular man had acquired, by his ingenuity and industry, an honourable independence, and died possessed of considerable property. From this brief history of James Sandy, we may learn this very instructive lesson, that no difficulties are too great to be overcome by industry and perseverance, and that genius, though it should sometimes miss the destination it desires, will seldom fail to secure, unless by its own fault, competence and respectability.

Lond. Mech. Mag.

GARDEN WALKS.

The following cheap improvement has been recommended in the construction of walks in gardens, lawns, &c. uniting the advantages of great hardness, durability, and prevention of the attacks of worms and insects. When a new walk is made, or an old one repaired, take the necessary quantity of road scraping previously dried in the air, and reduced as fine as possible; mix with the heap enough of

coal-tar from a gas work, so that the whole shall be sufficiently saturated, and then add a quantity of gravel; with this lay a thick stratum as a foundation, and then cover it with a thin coating of gravel. In a short time the walk will be as hard as a rock, not affected by wet or disfigured by worms.

MURIATE OF LIME.

The use of a solution of muriate of lime, has been recently adopted with success in the south of France, in the growth of Indian corn and other farinaceous vegetables. Two patches of corn were planted in a similar soil, one of which was regularly watered with the muriate of lime, and the other treated in the ordinary mode. The vegetation of the corn to which the muriate was applied, was much more rapid than that of the other, and the produce was finer in quality, and one sixth greater in quantity.

COTTON.

The superiority of cotton for the purposes of the loom, arises from the peculiar texture of the fibres. If these are examined with a good magnifier, they will be found to be furnished with minute hooks or teeth, which is the cause of their adhering very closely when woven together. Many other plants produce a silk, which, if softness only were sufficient for the purpose, would almost be equal to cotton; but they are improper from the want of these hooks, and will not coalesce without the mixture of other fibrous textures.

TO MAKE PEAS, &c. TENDER.

When peas, French beans, and similar productions, do not boil easily, it has usually been imputed to the coolness of the season, or to the rains: this popular notion is erroneous. The difficulty of boiling them soft arises from a superabundant quantity of gypsum imbibed during their growth. To correct this, throw a small quantity of subcarbonate of soda in the pot along with the vegetables, the carbonic acid of which will seize upon the lime in the gypsum, and free the legumes from its influence.—*Bulletin des Sciences.*

THE STARRY HEAVENS.

The firmament, exhibits at night, a scene of wonders which cannot fail to excite astonishment in every reflecting observer of nature; but why are there so few who attentively consider the star-bespangled heavens? I am willing to believe that in the majority, ignorance is the cause of this inattention; for it is impossible to be convinced of the grandeur of the works of God, and not be lost in admiration of the majesty of the most High, and not feel a rapture approaching to heavenly ecstacy. Would to God that I could kindle this divine rapture in your bosoms! To this end raise your thoughts to the firmament. In order to fill your hearts with astonishment at the majesty of the Almighty, I need only name to you those immense bodies scattered through the vault of heaven. Enthroned in the centre of our system is the Sun, whose orb is more than a million times larger than the earth, and is distant from it above ninety millions of miles. Notwithstanding the prodigious distance, how powerful is the influence he exercises on our sphere. Seven globes, which are denominated planets, move round the sun; these are opaque bodies, which receive light, heat, and perhaps also internal motion from the influence of the sun. Georgium Sidus or Herschell, Saturn, Jupiter, Mars, the Earth, Venus, and Mercury, are the names of the seven primary planets. Of these Mercury, is the nearest to the sun, and is, therefore, in general, invisible to the astronomer. Being considerably smaller than our earth, he gives to the firmament no extraordinary brilliancy. Next comes Venus, which is sometimes called the morning, and sometimes the evening star. This planet is one of the most luminous of the heavenly bodies, whether she precedes the rising of the sun, or succeeds his setting. Next follows our Earth, round which the moon revolves as a satellite: Mars is the fourth planet; Jupiter, with his belts, is always distinguished in the studded vault of heaven by his superior splendour. His apparent magnitude exceeds that of all the fixed stars. He is nearly equal to Venus when she is in full lustre, but his light is not so vivid as the light of that planet. How small is the earth in comparison to Jupiter! One hundred and fifty eight globes as large as our earth would scarcely contain as much matter as Jupiter. Saturn is removed to a still greater distance from the sun than Jupiter, and is about eighty times as large as the earth. Lastly, the Georgium

Sidus, or, as it is called from its discover Herschell, forms the present boundary of planetary system. The sun, with all the planets which accompany him, form, however, but a very small portion of the vast universe. Every star, though apparently no larger than a brilliant in a ring, is, in reality, an immense body, equal to the sun in splendour and dimensions. Thus each star is not only a world, but the centre of a magnificent system, surrounded by many others. It is in this light that we ought to consider the stars which glisten above our heads in the cold nights of winter. They are distinguished from the planets by their stronger light, and by always occupying the same position in the firmament. According to their apparent dimensions, they are divided into stars of the first, to the sixth magnitude; and these six classes comprise about three thousand. But though men have in some measure determined their numbers, it is, nevertheless certain that they are innumerable. The multitude of stars scattered over the face of heaven, which the strongest sight is scarcely able to discover, baffles every attempt at calculation. Telescopes, indeed, have opened to us a more extensive view of the creation; but it would be the height of folly in man, to suppose that the limits of his telescopes were the limits of the universe. If we reflect on the prodigious distance of the fixed stars from our earth, we shall find new reason to admire the immensity of the creation. Our senses alone teach us that the fixed stars must be at a greater distance than the planets. To their distance it is owing that they appear to be so small, indeed, points scarcely perceptible. This distance is truly inconceivable; for a cannon ball, supposing it to preserve all the time its original velocity, would scarcely reach the nearest fixed star in six hundred thousand years! What then are the stars? they are suns, which pour down upon us from their remote situations, not a borrowed light, but a light which is essentially their own—suns which the Creator has scattered by millions in boundless space, and each of which is accompanied by its planets, for whose benefit it was formed. But all these observations, however surprising they may appear, scarcely lead us to the threshold of created objects. Could we soar above the moon, and approach the planets, could we reach the most elevated of the celestial bodies that glisten over our heads, we should dicover new heavens, new suns, new stars, new systems, and perhaps infinitely more magnificent. Nor would the empire of our great creation

terminate there; but we should perceive with astonishmnt that we had only arrived on the frontiers of the universe. Little as we know of these works of the Almighty, still it is sufficient to direct our attention to the infinite wisdom, power, and goodness of our adorable Creator. Pause then, reader, and reflect. How great must be that God who formed all these immense spheres; who regulates their course, and upholds them by his mighty arm! And what is this sphere of earth, with all its splendid scenes, in comparison to the magnificence of the firmament! Were it ever annihilated, it would no more be missed than a grain of sand on the sea shore. What are provinces and kingdoms compared to those worlds? Nothing but atoms that float in the air, or sport in the ray of the noontide sun. And what am I, when I reckon myself among the infinite number of the creatures of God? How am I lost in my own insignificance! But so little as I feel myself in this particular; so great am I in another respect. How beauteous is the star-bespangled firmament, which God has chosen for his throne! Yet the heavens, with their countless worlds, are not endued with those intellectual faculties, with the precious gift of reason, which he has confered on me, the clay of his hand. STURM.

EFFECT OF MUSIC ON ANIMALS.

In the human ear the fibres of the circular tympanum radiate from its centre to its circumference, and are of equal length; but Sir E. Home has found that in the elephant, where the tympanum is oval, they are of different lengths, like the radii from the focus of an ellipse. He considers that the human ear is adapted for musical sounds by the equality of the radii; and he is of opinion that the long fibres in the tympanum of the elephant enable it to hear very minute sounds, which it is known to do. A piano-forte having been sent on purpose to Exeter Change, the higher notes hardly attraced the elephant's notice, but the low ones roused his attention. The effect of the higher notes of the piano-forte upon the great lion in Exeter Change was only to excite his attention, which was very great. He remained silent and motionless; but no sooner were the flat notes sounded, than he sprang up, attempted to break loose, lashed his tail, and seemed so furious and enraged, as to frighten the female spectators. This was attended by the deepest yells, which ceased with the music. Sir E. Home has found this inequality of the fibres in neat-cattle, the horse. the deer, the hare, and the cat.

NEW PUBLICATIONS,

AND CRITICAL NOTICES.

THOUGHTS *on the Original Unity of the Human Race:* **By C. CALDWELL. NEW-YORK, 1830. E. BLISS.**

The question whether the human race, descended originally from a single pair, or whether several pairs were distributed over different portions of the globe, has been the subject of frequent discussion. But when we admit, that our belief on this question, coincides entirely with the Mosaic account of the origin of mankind, we may perhaps subject ourselves to the suspicion, that we are not sufficiently unbiassed to give an impartial account of the work under consideration.

Dr. Caldwell's Essay was originally written for a review; but its length precluded its publication in that form. It is still, however, a review of Prichard's celebrated Researches into the Physical history of man, a work which Dr. C. himself characterizes as one of the most valuable monuments of learning, and ingenuity, which has appeared in modern times. In selecting Prichard then for criticism, our author has evinced a confidence in the strength of his weapons, and in the goodness of his cause, which, if it does not awaken our sympathies may at least awaken our respect. *Non ille pro caris aut patria timidus perire.*

It is scarcely necessary to state, that Prichard supposes the whole human race to have descended from a single pair, while Dr. Caldwell, without offering any hypothesis of his own, labours, to use his own language, "to beat down the false doctrines of others; for the rubbish of the old must be cleared away, before the foundation of the new fabric can be securely laid."

There are some preliminary, oratorical flourishes about the personal biases of Prichard, and his determination to make every thing bend to his theory, which are entirely unworthy of Dr. Caldwell. He should have recollected that this sort of charge, formerly dignified by the ancients, with the name of argument, is only fit for the party zealot, who impugns the motives of his adversary when he cannot reach him by fair and manly argument.

It was not by such a course, but by calm and dispassionate reasonings, that the work of Prof. Barton, on the origin of our native In-

dian tribes, was shown many years ago, to be false in its assumed facts, flimsy in its deductions, and superficial from beginning to end; and yet, if we are not mistaken, the public, for this able exposition was indebted to Dr. Caldwell. But to recur to the work under consideration.

Prichard's notion that seeds of plants may be transported by winds, rivers, creeks, currents, birds &c. and thus be multiplied over the earth, is called in question by Dr. C. for the following reason:

"The places where oak, hickory, walnut, and chestnut trees grow most abundantly, are not only not washed by streams of water, but are rarely in the neighbourhood of them The three first kinds of growth are usually found in plains, and on hills of moderate elevation, while the last prefers the sides of mountains, or even the summits, if not very lofty. By water, then, the large and heavy seeds of these plants have not been diffused. Much less can they have been scattered and planted by the winds. That mode is prevented by their specific gravity. For our author but one other means of conveyance remains; the bowels of animals. But what known animal, whether bird or quadruped, swallows either acorns, hickory nuts, walnuts, or chestnuts, and voids them again in a condition fit for vegetation? We reply, not one; and defy contradiction. When those nuts are eaten, the shells are broken, and the kernels digested. Instead of producing future trees, therefore, they produce blood and flesh, with such other forms of matter as belong to animals, and there the process ends. Against the competency of our author's scheme for the diffusion of thousands of other seeds, arguments equally valid might be urged."

What these are, the author has not thought proper to mention; but if they are no more valid than those above, our readers will perhaps be satisfied that Dr. C. has not taken the trouble to state them.

Our author supposes that the means suggested by Prichard are unworthy of the omnipotence of the Deity. He is the *great cause* of *causes*, not the petty cause of every minor effect, and in accordance with these strictly devotional views, he professes to ascribe the development of the vegetable kingdom over the face of the globe, to their spontaneous origin every where in obedience to the will of the Deity. He endeavours to support this idea by referring to the well known facts, that in this country if a forest of pine be cut down, it will be succeded by another of oak or hickory. He believes that if the whole vegetable kingdom, stalks, reeds and roots, were entirely destroyed, the earth would produce them again. Or in other words, he believes (at least as far as vegetables are concerned) in the monstrous doctrine of spontaneous generation. Only one little step farther, and all *animals*, including lordly man, might be supposed to have originated in the same way; but this would have been too near an approximation to the Mosaic account, as defended by Dr. Prichard.

The hypothesis of Prichard, that the present varieties of the human race were produced by the operation of physical causes now in existence, is ably controverted by Dr. C. in the following words.

"According to accredited dates, it is four thousand one hundred and seventy-nine years since Noah and his family came out of the ark. They are believed to have been of the Caucasian race; and the correctness of the belief there is no ground to question. We shall assume it, therefore, as a truth, without adducing the reasons which seem to sustain it. Three thousand four hundred and forty-five years ago, a nation of Ethiopians is known to have existed. Their skins, of course, were dark, and they differed widely from Caucasians in many other particulars. They migrated from a remote country, and took up their residence in the neighbourhood of Egypt. Supposing that people to have been of the stock of Noah, the change must have been completed, and a new race formed, in seven hundred and thirty-three years, and probably in a much shorter period."

"When that household descended from the ark, they were eight in number, all of the same race, and by them the earth was to be peopled, with the several races which now inhabit it. As we possess no information to the contrary, we are bound to believe that physical causes were the same then that they are now. The influence of climate was no stronger, and could not, therefore, in a shorter time, produce in man the changes necessary for the formation of a new race. But, as already mentioned, in seven hundred and thirty-three years from the time of Noah's debarkation from the ark, a nation of the Ethiopians existed; and a party of them, migrating from the Indus, the chief river of their native country, settled on the borders of upper Egypt. They had black skins, and features different from those of the ancient Egyptians, who appear, from their mummies, to have been Caucasians. Were the changes, which thus constituted a new race, the product of climate? A reasonable answer to this question can be derived only from the effect of climate, at the present time, and within the period known to history. And it must be negative. In seven hundred and thirty-three years, climate cannot now produce a new race; nor has it been able to do it, in that period, for the last two thousand years."

The argument in favour of the original unity of the human race, advanced by Blumenbach and others, deceived by the resemblance between a few words in the languages of various nations, we have always thought to be of little real value, and in this we are happy to coincide with Dr. C.

"A resemblance between words, or even entire phrases, in the languages of different nations or races, has no tendency to prove that those nations or races were ever identical. It only shows that they have had an intercourse with each other, through commerce, by war, or in some other way. The Romans were not descendants of the Greeks, nor the Greeks of the Romans. Yet in their languages, there were many words, and not a few phrases, very much alike. These resemblances were evidently the result, not of an original identity of race, but of an intercourse between the two nations, long after the formation of their respective languages. Romans who visited Athens, for instruction in philosophy and eloquence, contracted helenisms, and incorporated them with their native tongue. The Spanish language contains numerous words and expressions of Moorish origin. Yet the Spaniards are not, as a nation, descended from

the Moors. Strike from our own language all resemblances to the Greek, Latin, and French, and only the skeleton of it will remain. Yet we are not the offspring of either of the nations, from whose languages we have drawn so abundantly in the formation of our own.

But we have already trespassed over our assigned limits. The specimens which we have given, and as we trust, impartially, will perhaps induce others to give the work of Dr. C. an attentive perusal. They will find it replete with original views, sketched by a vigorous hand. Ardent, and perhaps over zealous, in attacking his adversary, one cannot but admire the work as the production of a vigorous and profound thinker, and of an amiable and well-intentioned man. One word more and we have done. It is customary in mentioning a work, to include a notice of its typographical execution; and if new and well-cut type, good ink, and fine paper, were the only elements of typographical excellence, this book would deserve much praise. But, shades of Elzevie and Aldas! what has become of the race of proof-readers? are they extinct? petrified? fossil? to be dug up and studied as relics of an earlier age by some future Cuvier? In sober earnest, the errors of the press in this country are so great, as almost, we were about to say, to surpass its benefits. No French nor English works are disgraced by such errors; and it may be considered as ominous by the lovers of classical learning in this country that almost every *latin* quotation in the work under consideration has suffered the horrors of typographical martyrdom.

American Landscape. The first number of a work under this title has been published by E. Bliss of this city. It contains six beautiful views of American scenery, executed in a neat style of engraving by Durand, and accompanied by historical and topographical illustrations, principally from the pen of Bryant. It is the first of a series of views which the proprietors propose to publish, "intended to embrace some of the most prominent and interesting features of the varied scenery of our country." In the hands of men whose talents, in their appropriate departments, are so well known, and highly appreciated as those of Durand and Bryant, it cannot be doubted but the work will merit and receive a liberal patronage.

Lectures to young men on the formation of CHARACTER, &c. By JOEL HAWES—*Fourth Edition.* For some time past we have been intending to notice this volume, as we deem it one of those books which have for their object the same high aim which we have assumed in the publication of our "Magazine;" that of giving judi-

cious information to the younger class of the community and of kindling up a warmer desire to acquire what is useful, and avoid that which may amuse but not benefit.

This unpretending book is written by a clergyman who has for many years been known as a judicious practical writer—The volume gives full evidence of an author who thinks and writes as a practical man; one who not only feels the importance of his subject, but who is able to enter into the *minutiæ* of practical life, and aid by council and advice all those who will follow his precepts, in forming a character which will at once confer happiness and exert influence.

We have often felt the need of such a work and we earnestly entreat our readers to purchase it and peruse it carefully and minutely, examine all its principles, and *practice* upon those which are found correct.

The young mind, from its very nature needs an aid something like this, as it often looks within itself for guidance but finds none, it searches for it among friends, but it returns disappointed, for all have not the experience and knowledge which qualify them for instructers or guides.

A Year in Spain, BY A YOUNG AMERICAN.—We have seldom met with a volume of travels from which we have derived so much information, or have read with such unabated interest and pleasure as this. Of the manners, customs, domestic habits, &c. of the Spaniards of the present day, the people of this country know, comparatively, but very little; and of the present state of their agriculture, manufactures and arts, still less. The author, affords us much of the information that was wanting: though professing to be a young man, he has certainly shown much judgment in the selection of the objects, customs, &c., which he brings to the notice of his readers and not less ability in treating of them. He seems to be possessed of an equable temper, as well as maturity of judgment, never falling into a passion, and condemning this, that, and the other, because it happens to differ from what he has been accustomed to, *a la mode* the travellers of an other country; but describes things as he sees them, and apparently endeavours to make the best of every thing. Above all, the author has the happy talent of making his readers feel that they are accompanying him through Spain, and that they actually use their own eyes in viewing the country through which they pass, and form their own opinions of the people. We had intended making some extracts from the work, but are precluded from doing so at present by want of room.